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Priorities for New Source Performance Standards Under the Clean Air Act Amendments of 1977

Argonne National Lab, IL Energy and Environmental Systems Div

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PRIORITIES FOR NEW SOURCE PERFORMANCE STANDARDS UNDER THE CLEAN AIR ACT AMENDMENTS OF 1977

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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A.E. Smith, E.P. Levine, K.L. Brubaker

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The Clean Air Act Amendments of 1977 requires that the USEPA consider specific criteria in determining priorities for setting NSPS for major source categories: quantity of air pollutant emissions, extent to which air pollutant emissions endanger public health and welfare and the mobility and competitive nature of each source category. This report describes a methodology that has been developed for prioritizing source categories using the Clean Air Act criteria. The methodology, which employs three distinct computer programs, was applied to a data set of over 150 major source categories for nine different air pollutant emissions (particulate matter, sulfur dioxide, nitrogen oxides, hydrocarbons, carbon monoxide, lead, sulfuric acid mist, hydrogen sulfide, and fluorides). The methodology provides for giving different weight to each of the Clean Air Act criteria and the establishment of distinct future year goals of achievement for each pollutant. The program output is a prioritized list of source categories for NSPS promulgation over a ten year period based on a multipollutant source category emission analysis. Because the programs are computerized, the prioritized source category listing can be regenerated without great difficulty to reflect additional source categories or revised source category data.

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by

M.R. Monarch, R.R. Cirillo, B.H. Cho,
G.A. Concaildi, A.E. Smith, E.P. Levine, and K.L. Brubaker

Argonne National Laboratory
Energy and Environmental Systems Division
9700 South Cass Avenue
Argonne, Illinois 60439

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EPA Project Officer: Gary D. McCutchen
Emission Standards and Engineering Division

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Priorities for New Source Performance Standards Under the Clean Air Act Amendments of 1977

1. INTRODUCTION

1.1 BACKGROUND

The Clean Air Act (CAA) as amended[1] provides the fundamental enabling legislation for controlling air pollution in the U.S. It provides a number of different mechanisms by which the federal government can regulate the emissions of air pollutants. One of the more important mechanisms is described in Section 111 of the CAA and is commonly referred to as New Source Performance Standards (NSPS).

Under this section of the Act, the Administrator of the Environmental Protection Agency is empowered to issue regulations restricting the discharge of air pollutants by new and modified stationary sources. It is the intent of the Act that eventually all significant emission-producing sources will have NSPS promulgated for them so that new facilities will be built to the best level of emission control that is economically feasible.

In reviewing air pollutant emission-producing activities it is immediately obvious that the number of source categories and pollutants requiring control is very large and that the process of establishing NSPS must follow a priority schedule designed to allocate resources to the most important sources first. The CAA amendments of 1977 attempted to provide guidance on the criteria to be used in establishing priorities and on the desired schedule for developing standards.

The 1970 version of the Clean Air Act requires that [Section 111(b)(1)(A)]:

> "The Administrator shall, within 90 days after the date of enactment of the Clean Air Amendments of 1970, publish (and from time to time thereafter shall revise) a list of categories of stationary sources. He shall include a category of sources in such list if he determines it may contribute significantly to air pollution which causes or contributes to the endangerment of public health or welfare."

The Clean Air Act Amendments of 1977 further require that [Section 111 (f)(2)]:

> "Not later than one year after the date of enactment of this subsection [Section 109(a)], the Administrator shall promulgate re-

> gulations listing under subsection (b)(1)(A) the categories of major stationary sources which are not on the date of the enactment [August 7, 1977] of this subsection included on the list required under subsection (b)(1)(A)...",

further that [Section 111(f)(2)]:

> "In determining priorities for promulgating standards for categories of major stationary sources for the purpose of paragraph (1), the Administrator shall consider -
>
> (A) the quantity of air pollutant emissions which each such category will emit, or will be designed to emit;
>
> (B) the extent to which each such pollutant may reasonably be anticipated to endanger public health or welfare; and
>
> (C) the mobility and competitive nature of each such category of sources and the consequent need for nationally applicable new source standards of performance"

and again [Section 111(f)(3)]:

> "Before promulgating any regulations under this subsection or listing any category of major stationary sources as required under this subsection, the Administrator shall consult with appropriate representatives of the Governors and the State air pollution control agencies."

It is in the context of these legislative requirements that this study has been undertaken.

1.2 PURPOSE

With the stringent time schedule and the limited resources available to develop NSPS for the large number of source categories, it becomes important to establish priorities. It is the purpose of this work to develop and apply a systematic methodology for choosing the source categories that should be considered first for in-depth analysis prior to NSPS promulgation. As will be reiterated several times throughout this report, the objective of this exercise is to conduct a preliminary, but comprehensive, screening of source categories to select those of most concern in developing NSPS. The criteria used in establishing these priorities are the three specified in the CAA. It is not the intent of this study to present the final decision on NSPS priorities nor to present extremely accurate industry growth and emission projections. The intent is only to present decision-makers with sufficient technical information upon which to make informed policy choices as to where limited resources are best spent.

The emphasis in this study has been to be systematic in reviewing the available information. As with any analytical procedure, this methodology is presented for review and criticism in terms of both the procedures and data used and new information is always welcome.

1.3 PREVIOUS WORK

This study represents the extension of earlier Argonne efforts to develop NSPS priorities[1] using an extensive industrial data base developed by TRC, Inc.[2] The previous work focused on industry emission rates as the principal source ranking procedure and as such, addressed only one of the three criteria specified in the CAA. New methodologies have been developed here to account for the other criteria.

1.4 SOURCES AND POLLUTANTS CONSIDERED

Since the requirements of the CAA Amendments focus on developing a list of sources not yet listed or regulated under NSPS provisions, those source categories for which an NSPS has already been proposed or promulgated have been excluded from consideration here. This reduces the number of sources to be considered somewhat but still leaves the number in excess of 200 categories.

The pollutants considered here include the criteria pollutants (particulates, sulfur dioxide, nitrogen oxides, hydrocarbons, carbon monoxides), lead, sulfuric acid mist, hydrogen sulfide, and fluorides. The first five have had a National Ambient Air Quality Standard (NAAQS) promulgated for them. Lead has a NAAQS proposed. The others are designated pollutants and have had NSPS set for some sources.

2 METHODOLOGY

2.1 OVERVIEW

Figure 2-1 outlines the procedure by which the prioritization requirements of the Clean Air Act Amendments of 1977 (CAA) were addressed. The first step is to establish a base of information about each industrial source category. This information included industry capacity, growth rates, emission factors (for the criteria pollutants, lead, fluorides, acid mist, and hydrogen sulfide), representative plant sizes and stack parameters, and others. The data used in this study was drawn primarily from reports published by the EPA's Office of Air Quality Planning and Standards and Industrial Environmental Research Laboratories. Internal EPA memoranda, open literature publications, and private communications were also used to supplement this information. A detailed set of references and calculations made from this data base are presented in the appended volumes to this document.

From this data base, those industrial categories for which an insufficient amount of data existed to include them into the analysis were identified. These sources will have to be reviewed at some later time when more information is available.

Since the CAA requires development of NSPS priorities for major sources of air pollution, the next step in the methodology is to screen out the minor source categories. This is done on the basis of an individual facility having the potential to emit 100 tons/year of one or more of the pollutants under study. It must be pointed out that this is measured on the basis of uncontrolled emissions with no consideration of control device efficiency, although recognition is given to control benefits resulting from industrial practices involving product recovery. This criteria is consistent with the definition of a major source in the CAA.

The minor source categories were evaluated independently of the major source group.

The next step involves three parallel paths to address each of the three prioritization criteria identified in the CAA.

1. To determine priorities on the basis of emissions, industry capacity, growth rates, and emission rates are combined to produce a national pollutant emission total for that industry as a function of time; the impact of setting an NSPS on this national total is then computed; and the sources are then ranked on the basis of achieving the greatest reduction in national emissions through an NSPS program.

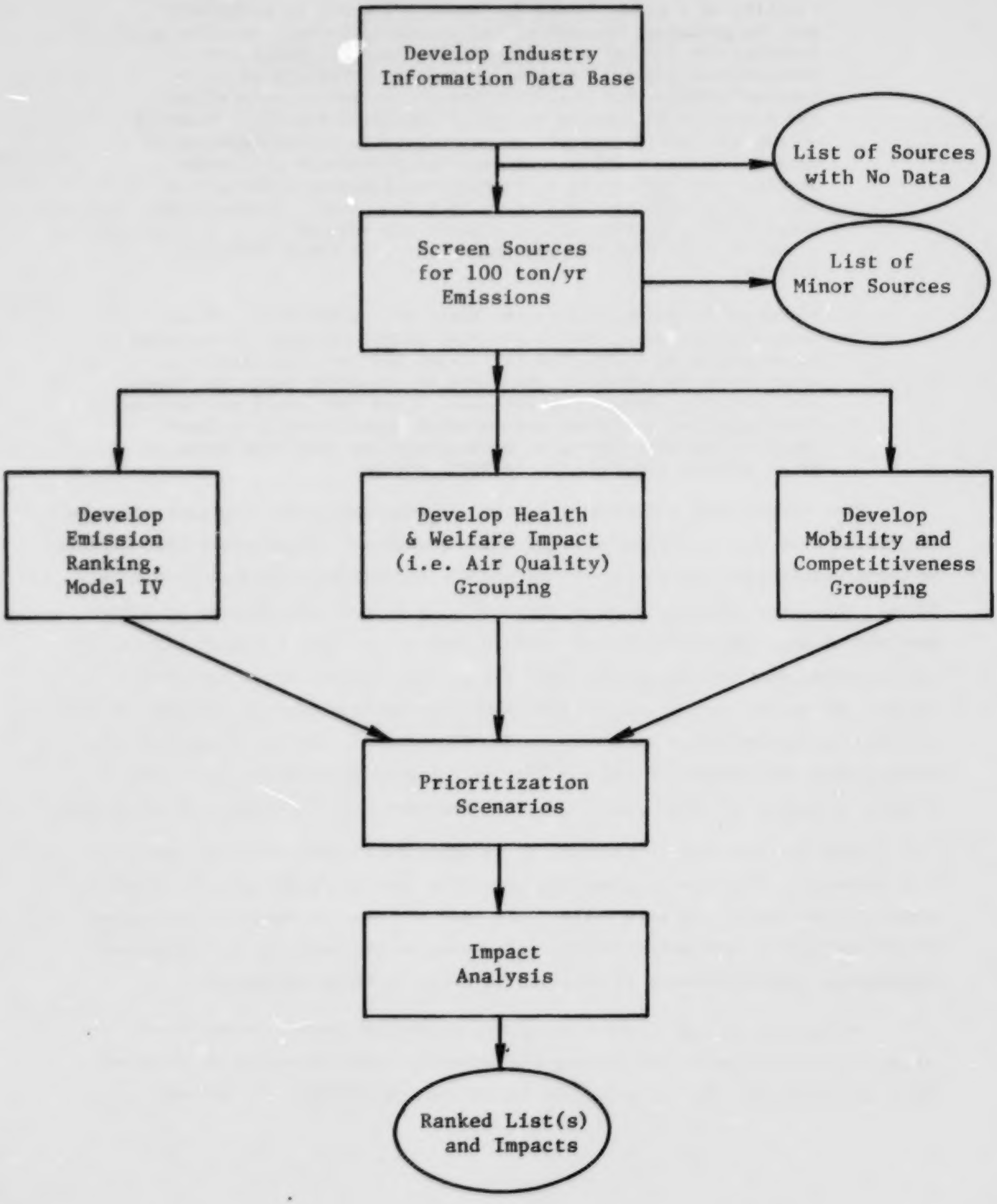
Develop Industry Information Data Base
List of Sources with No Data
Screen Sources for 100 ton/yr Emissions
List of Minor Sources
Develop Emission Ranking, Model IV
Develop Health & Welfare Impact (i.e. Air Quality) Grouping
Develop Mobility and Competitiveness Grouping
Prioritization Scenarios
Impact Analysis
Ranked List(s) and Impacts

Fig. 2-1. NSPS Prioritization Procedure

2. To determine priorities on the basis of potential health and welfare impacts it is first assumed that these impacts are measured by ambient air quality concentrations. A representative facility in a given industrial source category is postulated and the pollutant concentrations generated by that facility are computed for typical meteorological patterns. These concentrations are compared against an ambient threshold value (a National Ambient Air Quality Standard, where one exists) and the source is determined to have a potential for high, moderate or low air quality impacts after a subjective consideration of expected receptor impact and expected background pollutant levels. This procedure is carried out assuming emission control levels with and without an NSPS in effect. Sources with potentially high air quality impacts are assumed to be of higher priority in an NSPS program than those with lower potential impacts.

3. To determine priorities on the basis of the mobility and competitiveness issue, each industrial source category is reviewed to determine if individual facilities had the flexibility to make siting decisions on the basis of comparing state and local air pollution control regulations. Those that could not because they were tied to either raw material supplies or to a fixed local market were deemed to be immobile and were considered to be of a lower priority in the NSPS program.

With these three independent ranking schemes completed, the next step was to combine them into a single prioritization procedure. There are a wide variety of permutations that can be carried out by giving different weights to the criteria. The first one that appears reasonable is to consider sources with high mass emissions, high potential air quality impact, and high mobility first; sources with high mass emissions, high air quality impact, lower mobility second; and so on. It is easy to postulate alternatives such as placing the emission consideration to a lower priority than the air quality consideration, disregarding mass emissions and mobility to focus on air quality only, and others. A number of these prioritization scenarios were developed for evaluation.

Once the scenario is defined, it is possible to determine the impact of that scenario. The impact parameters used here were national emission totals, number of new facilities with potentially high air quality impacts, and number of new facilities with potential for relocating on the basis of air pollution regulations. Each scenario is assessed in terms of these variables.

Finally, a set of lists ranking the industrial source categories by the prioritization scenario and showing the impacts of each scenario is drawn up. This is the output that is presented to the decision-makers for review.

This prioritization methodology is carried out first for each pollutant separately. The prioritization scenarios are then redeveloped by considering the combination of pollutant-specific scenarios.

In the following sections of this chapter each of the steps of the methodology are explained in more detail. Results of the analysis are presented in the following chapter.

2.2 INDUSTRY DATA BASE

The information upon which the methodology was based was drawn from a substantial amount of work conducted by EPA or under EPA sponsorship. The types of information used included:

USEPA Industrial Screening Studies
USEPA Source Assessment Studies
USEPA Standards Support and Environmental Impact Snatements (SSEIS)
USEPA Industrial Process Profiles
USEPA Internal memoranda
Published literature (e.g. journal articles, trade journal information)
PREDICASTS, Inc. computer data bases
Census of Manufacturing data

The intent of this activity was to update and add to the information contained in the earlier TRC work.[3] As such, the TRC data provided the starting point and efforts were directed at identifying more recent information. In addition, over 40 new source categories were added to the TRC list for evaluation. Reports published prior to 1974 were not reviewed as it was assumed that the TRC work had already covered that material. TRC-computed state emission levels, current as of 1975, were not updated. There was no systematic attempt made to verify or cross-check the TRC data. Only new information was considered and where this was lacking, the TRC data was taken without change except that the nationwide industry capacity was updated to 1980.

The most significant new data collection efforts were focused on those source categories that were not included in the TRC work and on the assembling of dispersion parameters (e.g. stack heights, stack gas exit volumes, exit temperature, etc.) and typical source size characteristics, neither of which were included previously.

An initial screening of the source categories was carried out to eliminate those for which an NSPS has already been proposed or promulgated. Since this study was designed to prioritize only those sources that have not yet been closely evaluated by EPA for NSPS, there was no need to consider these sources.

It is immediately evident that the large number of source categories (over 200 Major and Minor), the large volume of reference material (over 300 citations), and the short time frame (3 months) did not permit an in-depth analysis of each industry. Since the purpose of this study is to provide a rapid overview of all industries to identify where more detailed analyses need be initiated, the methodology was designed to provide easy accommodation of new data as it becomes available. It is expected that the results of this work will be modified as more extensive and more carefully evaluated information is generated.

Table A-1 in Appendix A gives those source categories for which an inadequate amount of information existed. In most cases some data were available but the gaps were significant enough to prevent inclusion in this study. They will need to be reconsidered at some later point.

2.3 MAJOR SOURCE SCREENING

Under the provision of the CAA, NSPS are to be considered for major sources. Section 302(j) of the CAA was used to define major sources as "... any source which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant (including any major emitting facility or source of fugitive emissions of any such pollutant, as determined by rule of the Administrator)."

The emission potential for each source category was determined by multiplying the emission rate in tons of pollutant per unit of production by the source production in product units per year. There are several assumptions made in this calculation. First, it was assumed that the source was operating at full capacity throughout the year. This is rarely the case in practice; nevertheless, the interpretation of the CAA definition of the source having the potential to emit 100 tons per year seems to indicate that this is a reasonable approach. Second, it was initially desired to choose a source size that represented the median of the size distribution occuring in practice. However, the data available did not permit an accurate determination of size distributions; in most cases only a limited number of data points on source size were available.

The source size data must therefore be considered as only representative of order of magnitude sizes and subject to further review and revision.

In most instances trade journals, screening studies, etc. provided data as to the number of establishments for a given year. In some cases the census of manufacturers was used to determine the number of establishments. The total capacity for a given year was then divided by the total number of establishments for the same or near term year to determine a hypothetical source of average size.

A determination was made as to the source size necessary to have the source emit 100 tons/year. The source was then reevaluated to determine if there existed an individual source size which qualified as a major source. There were 13 marginal source categories in the minor source list which qualified as major source categories as a result of the screening. These source categories were reclassified as major.

Table A-2 in Appendix A lists the sources with uncontrolled emission potential of less than 100 tons/year and hence classified as minor sources. The table indicates for each source category, by pollutant, the emissions based on the average size (top row) and the size required to result in a 100 ton/year emission (bottom row).

Out of a total of 203 source categories evaluated, 47 sources were classified as minor source categories. The 156 major source categories were evaluated independently of the minor source categories.

2.4 EMISSION PRIORITIZATION

The concept of setting priorities for NSPS based on emissions uses the methodology referred to as "Model IV." This procedure has been described extensively elsewhere[3] and is only summarized here. This summary is drawn from Reference 2.

Model IV was developed by George Walsh of the EPA's Emission Standards and Engineering Division and is the latest methodology in an evolving mass emission source priority rating system that is based on determining the relative impact of NSPS on industrial emissions. The fundamental prioritization parameter generated by the model is the "additional control potential" of new or revised NSPS relative to baseline year control regulations. This parameter is denoted as (Ts-Tn) where:

Ts = total emissions under control regulations existing in the baseline year, and

Tn = total emissions under new or revised NSPS.

By computing this parameter for a given year for each individual source category, it is possible to determine what emission reductions could be achieved by NSPS above and beyond current state regulations. Promulgation of standards for sources with the largest Ts-Tn values would result in the greatest emission reductions while control of sources with small Ts-Tn values would have little impact on national emission rates. This rating can be used as one means of establishing a hierarchy for the setting of standards within the confines of limited resource availability.

Table 2-1 lists the parameters considered in the Model IV calculations. The industrial capacity parameters are a measure of the level of emission-producing activity of the source category. New Source Performance Standards, when promulgated, are applicable to the capacities B and C that represent the replacement of obsolete facilities and the construction of additional capacity, respectively. The baseline year capacity A is subject to state regulations only. The fractional utilization K accounts for unused capacity. Since K was generally derived by TRC from dividing nationwide production by capacity for a specified year, it appears reasonable to assume that K reflects the preferred capacity utilization of the industry and takes into account the amount of physical capacity utilized adjusted for the normal operating schedules, maintenance shutdowns, etc.

The industrial growth parameters are used to measure the rate of expansion of an industry both in the replacement of obsolete facilities and in the construction of new facilities. The growth rates P_B and P_C may be simple or compound. It is intuitively obvious that industries with large growth rates should have standards promulgated as soon as possible to bring the large number of new plants and facilities under best available control. The production capacities B and C are related to the growth rates by Eq. (2-1) and (2-2):

$$B = A\left[(1 + P_B)^i - 1\right] \quad (2\text{-}1)$$

$$C = A\left[(1 + P_C)^i - 1\right]$$

for compound growth;

Table 2-1. Parameters for Determining Ts-Tn by Model IV

Parameter	Symbol	Factor	Units
Industrial Capacity	K	Fractional utilization of existing industry capacity	
	A	Baseline year production capacity	Production units/year
	B	Production capacity from construction and modification to replace obsolete facilities	Production units/year
	C	Production capacity from construction and modification to increase output above baseline year capacity	Production units/year
Industrial Growth	P_B	Construction and modification rate to replace obsolete capacity	Decimal fraction of baseline capacity/year
	P_C	Construction and modification rate to increase industry capacity	Decimal fraction of baseline capacity/year
Emissions	E_u	Emissions with no air pollution controls	Mass/unit capacity
	E_s	Allowable emissions under existing regulations	Mass/unit capacity
	E_n	Allowable emissions under new or revised NSPS	Mass/unit capacity
	$E_{111(d)}$	Allowable emissions for existing sources as required by Section 111(d) of the Clean Air Act	Mass/unit capacity

$$B = A\ i\ P_B \tag{2-2}$$
$$C = A\ i\ P_C$$

for simple growth.
where i is the elapsed time in years.

The emission rates are used to determine the magnitude of the emission impact of each source category. All of the Model IV parameters are incorporated into the Ts-Tn value of additional control potential by Eqns. (2-3) through (2-5):

$$Ts = E_s\ K(A-B) + E_s\ K(B+C) \tag{2-3}$$

$$Tn = E_s\ K(A-B) + E_n\ K(B+C) \tag{2-4}$$

$$(Ts-Tn) = K(B+C)\ (E_s-E_n) \tag{2-5}$$

The Ts and Tn values may be computed for any year of interest. In both cases, the year in which the NSPS is promulgated determines whether the industrial growth is controlled under state regulations (i.e., E_s) or NSPS (i.e., E_n). For the Ts-Tn calculations made by TRC,[3] it was assumed that the standard was set in 1975 and the impact on 1985 emission rates was determined. In this study 1980 is the base year and emissions are projected through 1990. The Model IV Analysis for Major Source Categories is found in Table A-3 and for Minor Source Categories in Table A-4 of Appendix A.

When dealing with a single pollutant, Model IV provides a straightforward method of establishing priorities for NSPS development. In its simplest form, the priority is based on selecting those sources for which an NSPS will have its greatest impact (i.e., the largest value of Ts-Tn) in the target year (1990 in this study). The structure of the model can, however, be adapted to address the issue of setting priorities among various pollutants. The procedure begins by establishing goals for each pollutant. These goals can be developed by evaluating air quality data, by looking at national emission totals, by reviewing the potential impacts of the various pollutants, or by any one of a number of other criteria. The simplest method is to set the same goal for all pollutants. In this study mass emission levels computed as (Ts-Tn) in 1990 were used as the pollutant goals. For the criteria pollutants (except CO) the goals were the 1990 level of emissions (i.e., Ts-Tn) if all NSPS were set in 1980. For the designated pollutants and CO the goals were the 1980 level of emissions under state standards.

At each point in time the emissions from sources regulated only by state standards will increase over the baseline due to growth and development. Emissions from NSPS-controlled sources will generally decrease as older equipment is replaced with NSPS-regulated controls and new, more stringently controlled sources come on-line. At each point, then, a measure of which pollutant should be considered highest priority can be gained by comparing the emission total to its goal. The pollutant that is furthest from its goal is designated as highest priority at that point.

This process of picking the priority pollutant at any point in time provides an objective and systematic way of setting the order in which NSPS can be developed. Some more detail on its use can be found in Reference 2. It is the mechanism used to address the first criteria specified in the CAA.

2.5 HEALTH AND WELFARE IMPACT PRIORITIZATION USING AIR QUALITY

The second criteria required for consideration by the CAA is the "... extent to which each such pollutant may reasonably be anticipated to endanger public health or welfare..." It is a fundamental assumption of this analysis that the potential for public health and welfare impacts of an industrial facility can be measured by its contribution to ground level air pollutant concentrations. This contribution can be compared to an "ambient threshold value" (ATV), which specifies the concentration level above which public health and welfare is adversely impacted.

This approach is entirely consistent with the philosophy of air quality management under the CAA. The establishment of National Ambient Air Quality Standards (NAAQS) uses the same assumption that public health and welfare protection can be achieved by controlling the ambient pollutant concentrations. It therefore seems reasonable to use this as a means of addressing the CAA requirements for NSPS priorities. The procedure followed here involves: (1) the postulation of a hypothetical facility of average size for each industrial source category, (2) the computation of expected maximum ground level concentrations from that facility, (3) the comparison of those concentrations to an ATV, (4) a subjective and crude review of the facility's siting trends to consider potential population exposure to the concentrations as well as expected background levels of the pollutant under study, and (5) a ranking of the facility into one of three groups: potentially high air quality impacts, potentially moderate air quality impacts, or potentially low air quality impacts.

2.5.1 Development of Ambient Treshold Values

To evaluate the relative health and welfare impact of a large number of industrial air emitting sources, a maximum ground level concentration (χ) was computed for each source category-pollutant combination and compared with an appropriate ambient threshold value (ATV) for the specified pollutant. This ATV represented the concentration above which adverse health and welfare effects could be expected. As described elsewhere in this report, source emissions were initially ordered in relation to the ratio of the ambient ground level concentration and its respective ambient threshold value (χ/ATV). In effect, this ratio permitted a normalization of concentrations among different pollutants on the basis of health and welfare for subsequent numerical ranking and statistical grouping.

An ATV was developed for each of the nine pollutants under study, and is presented in Table 2-2. For the pollutants which have previously been designated as criteria pollutants, the National Ambient Air Quality Standards (NAAQS) were utilized as the ATV value.[6,7] The pollutants within this category were particulate matter, sulfur dioxide, carbon monoxide, hydrocarbons and oxides of nitrogen. The suggested standard for lead which has been recommended for inclusion in the NAAQS was also used.[8] In the case of sulfur dioxide, where both a health and welfare standard exists for different exposure intervals, all threshold values were examined to determine the critical value. Whereas, for particulates, where a health and welfare standard exists for the same averaging intervals, the more stringent standard (the welfare-related value) was used. It should be recognized that the hydrocarbon standard does not reflect the direct health effects of the hydrocarbons themselves, but instead reflects their role as precursors of photochemical oxidants.

An ambient air standard for hydrogen sulfide and sulfuric acid mist has not been established under the USEPA designated pollutant regulatory program. The value listed in Table 2-2 reflects the Threshold Limit Value (TLV) designated as an acceptable exposure for work environments,[9] after adjustment by a commonly used safety factor of 100 which relates the health of the average worker to that of the general population. These values were utilized for comparison with ambient concentrations projected over 8-hour intervals.

Fluoride emissions have been recognized as causing or contributing to the endangerment of the public welfare and has been listed by the USEPA as a

Table 2-2. Summary of Health and Welfare Related Air Quality Values Used for Evaluation of Stationary Sources

Pollutant	Averaging Interval	Health Related Value	Welfare Related Value	Reference
Particulate	ANNUAL	75 μg/m^3	60 μg/m^3	
	24 Hour	260 μg/m^3	150 μg/m^3	6
Sulfur Dioxide	ANNUAL	80 μg/m^3		
	24 Hour	365 μg/m^3		
	3 Hour		1300 μg/m^3	6, 7
Carbon Monoxide	8 Hour	10 mg/m^3	Same as Health Related Value	
	1 Hour	40 mg/m^3		6
Nitrogen Oxides	ANNUAL	100 μg/m^3	Same as Health Related Value	6
Hydrocarbons	3 Hour	160 μg/m^3	Same as Health Related Value	6
Lead	30-Day	1.5 μg/m^3	Same as Health Related Value	8, 9
Hydrogen Sulfide	8 Hour	150 μg/m^3		Text
Sulfuric Acid Mist	8 Hour	10 μg/m^3		Text
Fluoride	30-Day		0.5 μg/m^3	11

designated pollutant. The ambient threshold value for fluoride presented in Table 2-2 reflects the suggested threshold for "...the prevention of significant foliar necrosis on sensitive species (of plants), or an accumulation of fluoride in forage of more than 40ppm."[10] Livestock ingestion of vegetation containing an accumulation of fluoride in excess of 40ppm has been shown to cause damaging effects. As such, this value is a welfare related value and is appropriate for averaging intervals of 30-days duration.

In the development of these ATV values several additional sources of information were consulted.[11,12]

2.5.2 Postulation of Representative Industrial Facilities

The relative public health and welfare impact of air emissions from an industrial facility is measured by its contribution to ambient air quality (X). For an interpollutant evaluation, the pollutant contributions are normalized by dividing by the appropriate ambient threshold value (i.e., X/ATV). In this analysis, the air quality contribution was determined by computing the projected concentration resulting from the dispersal of air emissions from a postulated representative source.

Source-specific stack gas dispersion parameters, namely, exit gas temperature, exit gas volumetric flow and stack height were developed for each source. Where detailed information was available, disaggregated process-specific dispersion information was utilized in computing an aggregated ground level concentration from a facility. In general, the data was disaggregated to the lowest level permitted by data availability. For some sources, stack gas data was not readily available from the literature. In these instances, the stack gas data was developed on the basis of engineering judgment such as the exhaust parameters relating to the control devices suggested for the source in question. A general source of stack exhaust data was from the EPA document entitled Exhaust Gases from Combustion and Industrial Processes.[13]

Ground level concentrations are also directly dependent upon the quantity of emission. For this analysis, the source strength was computed as the product of the capacity utilization (K), the state allowable emission rate (E_s) and a representative source capacity (Z), and recomputed using an emission limitation which reflected the best anticipated level of emission reduction (E_n). The capacity utilization factors (expressed as percent-decimal equivalent) were assembled from the literature. The choice of a representative source capacity (expressed as quantity of product per year) was typically computed by dividing the yearly national capacity total for a given product, by the total number of establishments manufacturing that product. This is discussed in greater detail in Section 2.3.

Some industrial source categories are composed of a number of identifiable sub-processes. In such cases, a maximum ground level concentration was computed for the facility by accounting for emissions from all of the sub-processes. An example of this is the phosphate rock preparation industry. For this industry a typical plant is composed of unit operations or sub-processes such as drying, grinding, conveying, storage and calcinating operations, on the same premises. Therefore, the typical phosphate rock preparation plant was represented by source and emission parameters for the identified unit operations.

Where several process variations exist for a source category manufacturing a specific product, more than one typical facility was postulated as being representative of the source category. An example of this is the coffee roasting industry where one representative facility would consist of a direct roaster, and additional operations of stoner cleaning, cooling and spray drying and another representative facility would consist of an indirect roaster plus cleaning, cooling, and spray drying. In this situation two representative composite plants were postulated to represent the coffee roasting industry (See Table A-2 in Appendix A).

2.5.3 Calculation of Ground Level Concentrations

In order to obtain a measure of the relative potential air quality impact from each source, a maximum time-averaged ground level concentration was estimated for each pollutant emitted from a representative facility for a later comparison with the appropriate ambient threshold value. The ratio of these values (X/ATV) were grouped into categories of potentially high, moderate and low health and welfare impact. Using this method, the air quality impact of a source is measured relative to the air quality impacts of all other source categories rather than measured on an absolute numerical scale. Since all simplifying assumption inherent in the model were equally applied to all sources, the relative air quality impact measurement appears reasonable and appropriate.

The methodology used to estimate the maximum concentration is presented below, and a more technical discussion of the approach is available in Appendix C.

Calculations of the maximum expected ambient pollutant concentration were performed using a Gaussian plume dispersion model. For time averaging intervals of less than 24-hour duration (short-term) the basic equation for the concentration from a single source is:

$$\chi(x) = \frac{Q \times 10^6}{\pi \mu \sigma_y \sigma_z} \exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2 \right] \qquad (2\text{-}6)$$

in which:

$\chi(x)$ = ground level centerline pollutant concentration at a distance x from the source, (micrograms/cubic meter);
Q = emission rate (grams/second);
μ = wind speed (meters/second);
σ_y = horizontal dispersion coefficient, a function of x (meters);
σ_z = vertical dispersion coefficient, a function of x (meters);
H = effective stack height (meters), given by the sum of the physical stack height h_s and the estimated plume rise Δh.

This concentration represents the ground level concentration below the plume centerline. Since the values of σ_y, σ_z and Δh are dependent upon the stability classification of the atmosphere, short-term calculations were performed for an unstable, neutral and stable atmospheric conditions in order to determine the set of conditions which produce the highest ambient concentration.

The worst case value for the wind speed (μ) was selected to be that which maximized the concentration. This value was calculated internally by the model, and may be expressed as:

$$\mu_{\text{critical}} = \frac{C}{h_s} \qquad (2\text{-}7)$$

where c = the plume use coefficient for the neutral and unstable category
and h_s = the physical stack height

This wind speed value was bounded by 0.8 - 15m/sec. The critical wind speed for the stable category was set at 2.0 m/sec.

The plume rise (Δh) for each source was calculated using the Briggs formulas which are presented in Appendix C.

For evaluating facilities containing more than one process, the algorithm incorporated two additional assumptions. The first assumed that all stacks were to be physically located at the same origin. This is a conservative assumption and produced concentrations higher than those which would be produced by the true stack configuration.

The second assumption was in the estimation of the distance at which the maximum concentration would occur. This distance was estimated by a weighted average of the distance to the maximum concentration from the individual stacks. The weighting function was assumed proportional to the ratio

$$wt \propto \frac{Q_i}{h_{s_i}} \qquad (2\text{-}8)$$

where, as before

Q_i = Source Strength for the i-th source

h_{s_i} = physical stack height of the i-th source.

This factor was selected because the source strength and stack height are the two most sensitive parameters in the dispersion equation. The equation for the "worst case" concentration estimate for a multiple source is given by equation 22 of Appendix C.

The Gaussian equation results in a concentration estimate that is commonly recognized as appropriate for an exposure of less than 1-hour duration. To determine the concentration for the averaging times corresponding to the ambient threshold values, the 1-hour estimate was adjusted by a time-averaged conversion factor which accounts for the increase in wind meander over longer time periods. This adjustment factor has the practical effect of reducing the concentration values over longer averaging times. The maximum concentration for time intervals between 1-hour and 24-hours was obtained from the relationship:

$$\chi_{max} = \chi_{max\,(1\text{-}hr)} \left(\frac{1}{t}\right)^{0.17} \qquad (2\text{-}9)$$

where χ_{max} = estimated concentration for the desired averaging time (t)

t = desired time interval (hours)

The conversion factors for averaging intervals that are associated with the short term ambient threshold values are given in Table 2-3.

Table 2-3. Averaging Time Conversion Factors[a]

Averaging Time (hours)	Conversion Factor
1	1.00
3	0.83
8	0.71
24	0.58

[a] Adapted from Ref. 14.

Since equation 2-6 is invalid for averaging intervals of more than 24-hours duration, a sector-averaged Gaussion equation was utilized to determine the maximum concentration for the pollutants associated with longer term averaging intervals. This equation has the following form:

$$\chi(x) = \left(\frac{2}{\pi}\right)^{\frac{1}{2}} \frac{fQ \times 10^6}{\mu\sigma_z\left(\frac{2\pi x}{N}\right)} \exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right] \tag{2-10}$$

in which:

N = the number of sectors into which the entire 360° range of wind direction is divided into; and

f = the fraction of the time during which the wind direction is observed to lie within the sector of interest;

the other symbols having been defined previously.

The maximum expected annual wind direction frequency in a 22.5° sector was established to be 0.25 from an examination of the annual surface wind roses given for a number of meteorological stations in the United States. The wind frequency estimated for a 30-day average (for the pollutants lead and fluoride) was developed by examining historical National Emission Data System (NEDS) sampling data, and developing a 30-day average using statistical techniques developed by Larsen.[16] This adjustment yielded an equivalent 30-day wind frequency factor of 0.4.

The national mean annual wind speed of 4.4 m/sec was used in the above equation. The maximum expected long-term concentration was estimated for neutral atmospheric stability using σ_z parameters appropriate for distances between 500 and 5000 meters.

Ground level concentrations from fugitive emission sources were estimated by treating the emission as a point source emanating from a 10-meter stack at a volume flow of 1 m^3/sec. This approach yielded unrealistically high concentrations from these sources. An area source treatment for estimating concentrations from these operations, particularly for mining activities, would have resulted in more realistic concentration estimates.

The following are the detailed steps of the dispersion model algorithm which were applied to each postulated facility:

- Identify all processes within the facility emitting each pollutant.
- Input the individual source parameters (gas exit temperature, gas volume flow, stack height and emission rate) for each process.
- Compute the critical wind speed for the unstable/neutral atmospheric stability category and test to see that they are within the appropriate range. Set the critical wind speed for the stable category to 2.0 m/sec.
- Compute the plume rise for the 3 stability categories.
- Compute the distance to the projected maximum concentration for each stability category (the critical distance).
- Compute the short-term concentrations at the critical distances.
- Compute the long-term concentration.
- Adjust the concentrations to the appropriate time-averaging intervals.
- Compute the ratio of the adjusted concentration to the corresponding ambient threshold value (X/ATV) and select the largest ratio.

Modeling Caveats. In calculating the maximum ground level concentration, it is assumed that Gaussian dispersion theory is valid for emissions of all pollutants treated in this study, irrespective of their chemical or physical makeup. All pollutants were treated as conservative gases. Typically, particulate matter sized below 30μm, behave sufficiently like a gas to permit this type of treatment.

Although the concentration values were considered to be a maximum value, they are only appropriate for "routine" meteorological conditions, flat terrain and average source operating conditions. These values are inappropriate for a plume impacting on elevated terrain (receptor heights greater than zero). Meteorologically unique or complex atmospheric situations such as downwash or low lying inversions were not considered in this analysis. In addition, since the source strength (Q) was calculated as the yearly capacity divided by the total number of establishments, the concentrations represent a maximum for average emissions and operating conditions.

Due to the weighting scheme that was applied to sources containing several processes, the model is most accurate for stacks having similar characteristics. Conversely, it is least accurate for computing ground-level concentrations from highly dissimilar processes. The model is also most accurate for process configurations containing stacks that are located in close proximity to each other.

It is important to note that the computed concentration values are subsequently grouped into categories of high, medium and low χ/ATV values, which represent potentially high, moderate and low air quality impact. Since the individual values are then treated as an element of the group, the relative positioning of the χ/ATV values with respect to the values from other sources is of greater importance than the actual concentrations. The assumptions used in this model treated each source similarly and therefore the relative positioning of sources into the three categories should be much less sensitive to the approximations inherent in the model.

2.5.4 Comparison With Ambient Threshold Values

The maximum ground level concentrations computed for the three stability classes (unstable, neutral, stable) were then normalized by dividing by the relevant ambient threshold values (ATV). The maximum χ/ATV was chosen from among the various stability classes and the various applicable averaging times. Table 2-4 shows the distribution of dominant averaging times and stability classes by pollutant. For those pollutants having both short and long term standards, the short term standard generated the largest air quality impact most of the time. Those sources with short stacks tended to show highest ground level concentrations under neutral meteorology while those with tall stacks, under unstable conditions. These trends are consistent with field observations.

Table 2-4. Distribution of Stability Class and Averaging Time for Maximum Normalized Concentrations

	Number of Occurences of Maximum χ/ATV								
	Meteorology[a]			Averaging Time[b]					
Pollutant	Unstable	Neutral	Stable	Annual	30-day	24-hr	8-hr	3-hr	1-hr
Particulates	75	33	0	33	–	75	–	–	–
Sulfur Dioxide	14	18	0	18	–	14	–	0	–
Nitrogen Oxide	–	38	–	38	–	–	–	–	–
Hydrocarbons	112	1	0	–	–	–	–	113	–
Carbon Monoxide	39	0	0	–	–	–	39	–	0
Lead	–	17	–	–	17	–	–	–	–
Acid Mist	4	0	0	–	–	–	4	–	–
Hydrogen Sulfide	4	0	0	–	–	–	4	–	–
Fluoride	–	20	–	–	20	–	–	–	–

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[a] Neutral meteorology was used for 30-day and annual standards.

[b] χ/ATV not calculated for other than averaging times specified by standards.

The normalized concentrations (χ/ATV) provide a method of comparing the relative potential for health and welfare impacts of the various pollutants. By using this method it is implicitly assumed that the potential for impacts caused by a given χ/ATV ratio is the same for all pollutants. Thus, a source producing a ground level concentration of particulates of 15 $\mu g/m^3$ (10% of the particulate ambient air quality standard) is assumed to have the same health and welfare impact potential as a source producing a ground level concentration of 36.5 $\mu g/m^3$ of SO_2 (10% of the SO_2 ambient air quality standard). There are, of course, many factors not considered in this approach such as reactivity of pollutants, scavenging and settling, to cite a few. Nevertheless, if it is assumed that the establishment of National Ambient Air Quality Standards (NAAQS) and Threshold Limit Values (TLV) for Workplace Environments is based on defining a concentration level above which impacts may be expected, then this appears to be a reasonable approach to obtaining a first order approximation to relative health and welfare impacts.

The problem of dealing with hydrocarbons and nitrogen oxides in this fashion is of special interest. Both are photochemically reactive and although the NAAQS for NO_2 is based on health impacts, the NAAQS for hydrocarbons is recognized only as a guideline for meeting oxidant standards. Hydrocarbons as a class are not considered as a health hazard at ambient concentrations.[19] For these pollutants it must be remembered that the χ/ATV values offer only the roughest of impact indicators.

Fig. 2-2 shows the distribution of normalized concentration values for all the sources considered. These values were computed using the emission rates for state standards only (i.e. Es). Several things are evident from the plot. First, the ranges of normalized concentrations overlaps for all pollutants. No one pollutant is consistently larger or smaller than all the others. This tends to lend support to the normalizing procedure as a means of putting all pollutants on the same basis.

Second, the spread of the data is quite large (5 orders of magnitude). The distribution is heavily skewed toward the low end as evidenced by the separation of the mean and the median values. This means that the majority of facilities are small with relatively small air quality impacts from individual plants. This is to be expected since most of the large air pollution sources

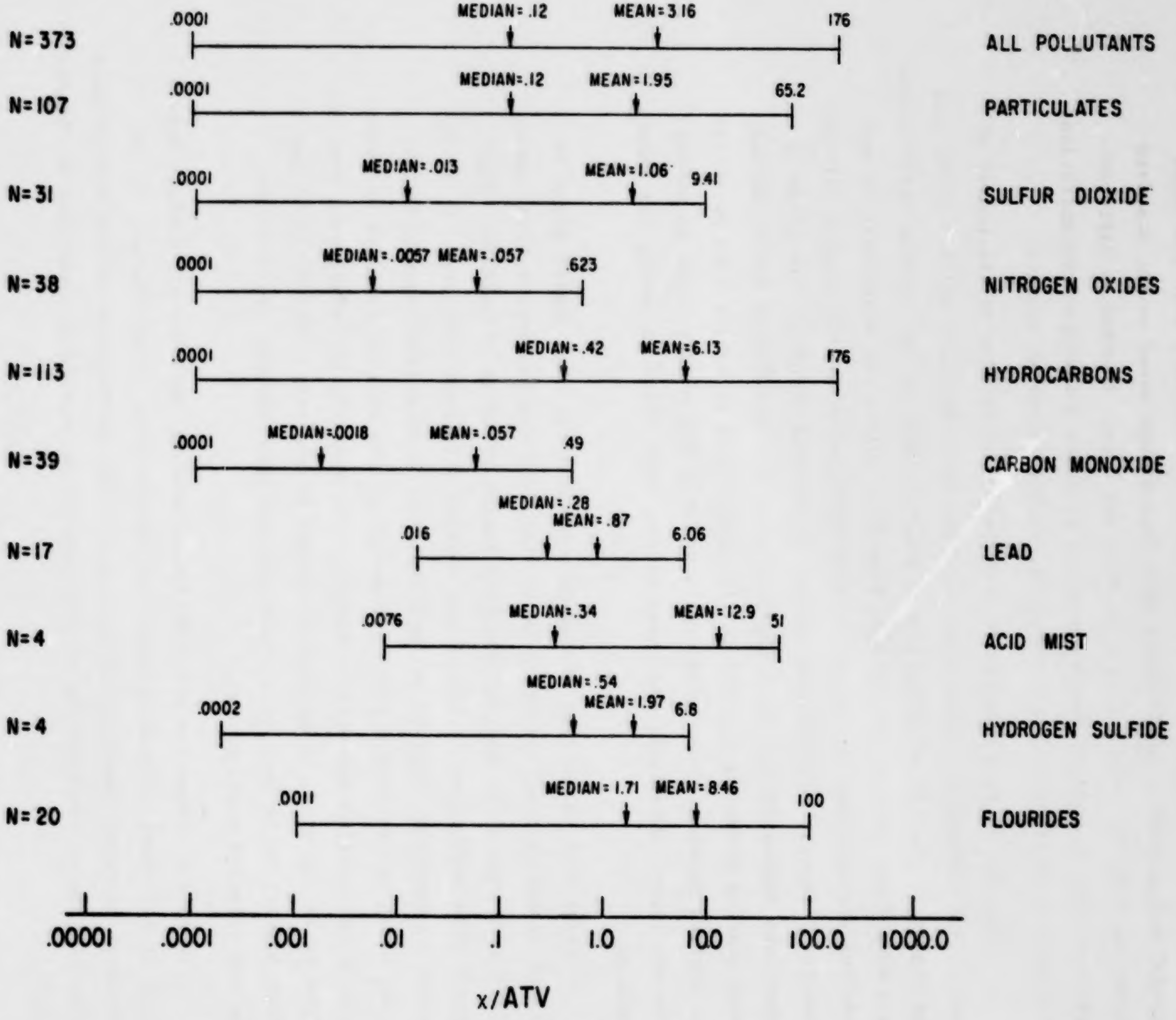

Fig. 2-2. Range of Normalized Ground Level Concentrations

already have NSPS proposed or promulgated and hence have been excluded from this list.

Third, the skewness of the distribution indicates that the usual statistical procedure of dividing data into groups based on the standard deviation from the mean will not be relevant here. Instead, a different approach must be used to determine which of these normalized concentrations should be classified as high, moderate, or low potential impacts.

Fig. 2-3 shows a cumulative frequency distribution of the number of sources with normalized concentrations less than the scale value. (Note that the figure is plotted on a logrithmic scale.) Half of the sources investigated have normalized concentrations less than 0.1. Given the weaknesses in the modeling approach and the intent of this exercise to provide only a relative measure of impact, it therefore appears reasonable to divide the range of normalized concentration (on a logrithmic scale) into thirds and to define those sources producing a χ/ATV in the upper third as having high potential air quality impacts, those producing a value in the middle third as having moderate impact potential, and those in the lower third as having low impact potential.

Using this definition of impact potential the high impact group is defined as having χ/ATV values greater than 0.5, the low impact group having values less than 0.01, and the moderate impact group in the middle. This process puts approximately 1/3 of the sources into each category. It is important to emphasize that no attempt was made to establish these groupings on the basis of defining a given percentage of the ambient standard as being a significant health and welfare hazard. The modeling procedure used here was judged to be too crude to warrant this type of analysis. The division into thirds appears to be much more reasonable and more closely satisfies the need for relative rankings only.

Table 2-5 shows the distribution of sources into the air quality impact groups by pollutant. These results will be discussed in more detail in the individual pollutant analysis of Section 3. The distribution is not exactly into thirds because of the shifting of some borderline sources as described in the next section.

The concentration calculations were repeated for emission rates under NSPS (i.e. using En). In many cases the result was to move a source category

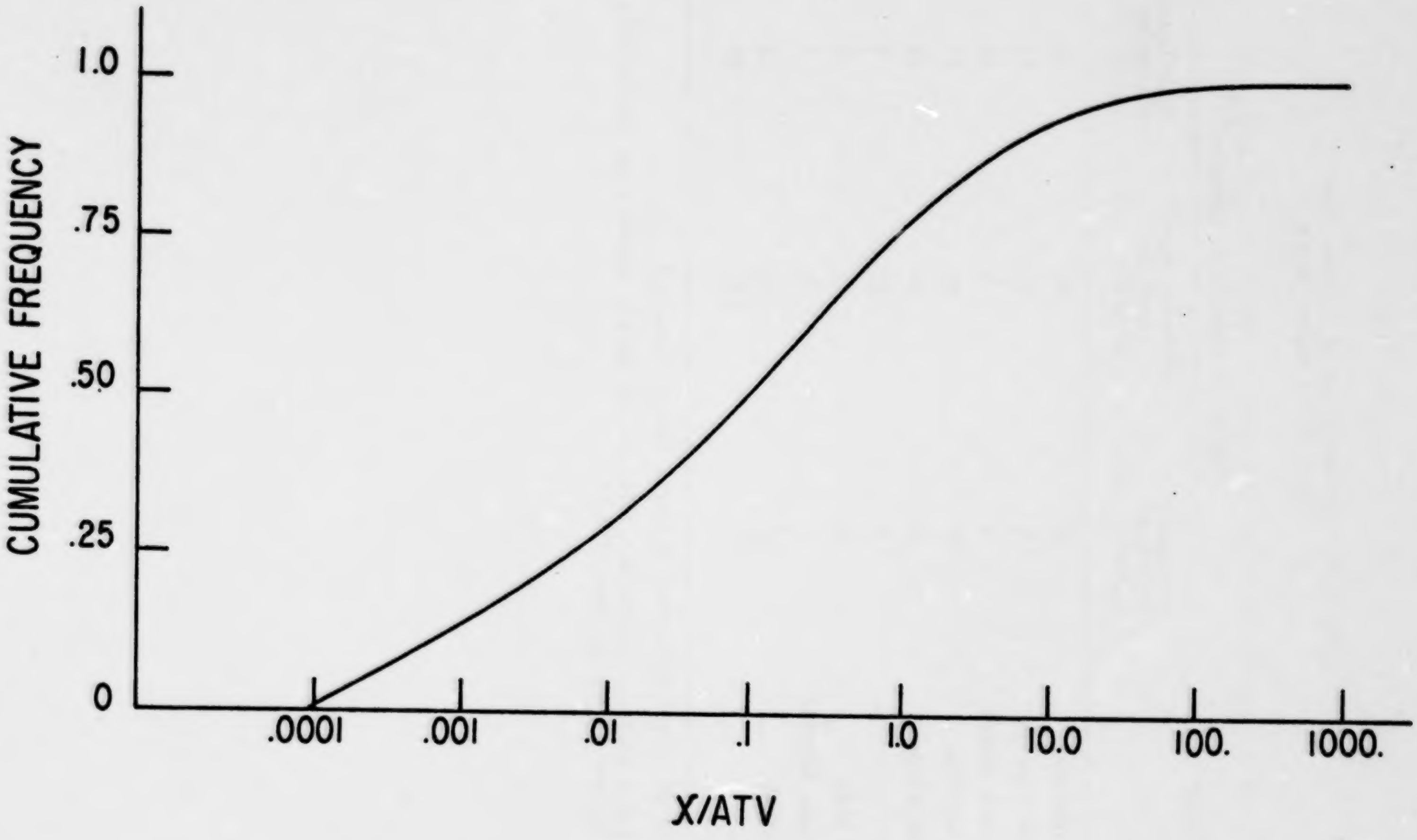

Fig. 2.3. Distribution of Normalized Ground Level Concentrations.

Table 2-5. Distribution of Sources Into Air Quality Impact Group

Pollutant	Number of sources in Category[a,b]		
	Low Impact Potential (χ/ATV $\le$ .01)	Moderate Impact Potential (.01 $<\chi$/ATV $\le$ .5)	High Impact Potential (χ/ATV $>$ .5)
Particulates	24	64	21
Sulfur Dioxide	6	12	14
Nitrogen Oxides	3	8	22
Hydrocarbons	58	38	17
Carbon Monoxide	0	16	23
Lead	5	12	0
Acid Mist	2	2	0
Hydrogen Sulfide	2	1	1
Flourides	17	2	1
Total	117	155	99

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[a] Based on state-controlled emission levels (i.e. E_s)

[b] Includes sources shifted according to population exposure and air quality background potential (Sec. 2.5.5)

into a lower impact group. There were, however, some instances where the NSPS control level was not adequate to move a source out of a high or moderate air quality impact group. In a few cases a source was in a high impact group both before and after NSPS promulgation. This type of analysis can be used to identify research and development program priorities for emission control technologies. These results are discussed in more detail in Section 3.

2.5.5 Evaluation of Siting Trends on Air Quality Impact

Another issue can be raised as far as the potential for public health and welfare impacts of a given source. It would be desirable to give more weight to those sources that tend to locate in high population areas and less weight to those locating in remote areas. Data on siting trends for all the industries considered was not available but it was possible to pick out the obvious sources that are remotely located (e.g. mining activities) and those that are generally located in high population areas (e.g. urban service industries).

In this same context, source categories that are generally associated with other air pollutant sources (e.g. industrial boilers comprising only one of many emission-producing activities at a site) should be given more weight as their contribution to ground level concentrations must be put in the context of the contributions from surrounding sources. Again, detailed data was not available for all source categories so only the obvious "high background" sources could be identified.

In attempting to give more weight to the high population location and high background sources, and less weight to the remote location sources it was decided to follow the same relative ranking procedure used for the overall air quality impact analysis. Each of the three impact groups based on normalized concentration ratios was subdivided into 3 zones of equal size. Any high population or high background source lying in the upper zone of a group was moved to the next highest impact group while the remote sources in the bottom zone of a group was moved to the next lowest group. If a high population or high background source was in the middle or lower third of its group, its air quality impact rating was not changed. Likewise, if a remote source was in the upper or middle third of its group it was not moved.

Table 2-6. Sources Considered for Adjustment of Air Quality Impact Rating

Source Category	Reason for Adjustment[a]	Actual Admustment Made		
		Pollutant	From	To
Fossil Fuel Boilers (<.3 x 10^6 Btu/hr)	HP, HB	——	None	None
Fossil Fuel Boilers (0.3-10 x 10^6 Btu/hr)	HP, HB	SO	Low	Moderate
Fossil Fuel Boilers (10-250 x 10^6 Btu/hr)	HP, HB	NO	Low	Moderate
Mixed Fuel Boilers	HP, HB			
Coal and Refuse		SO HC AM	Low Low Low	Moderate Moderate Moderate
Oil and Refuse		HC	Low	Moderate
Waste Oil Combustion Boilers	HP, HB	PM HC	Moderate Low	High Moderate
Industrial Incineration	HB	SO	Moderate	High
Industrial - Commercial		SO NO	Moderate Moderate	High High
Industrial Organic Liquid Waste		PM NO	Low Low	Moderate Moderate
Municipal Incineration (≤ 50 ton/day)	HP	SO NO	Low Low	Moderate Moderate
Borax and Boric Acid Plants	HB, LP	——	None	None
Sodium Carbonate (Soda Ash) Industry	LP	——	None	None
Sodium Chloride Production Industry	LP	—	None	None
Fuel Conversion (Coal Gasification/Liquefaction)				
High Btu Gas	LP	—	None	None
Alfalfa Dehydrating Plants	LP	—	None	None
Animal Feed Defluorination Plants	LP	—	None	None
Direct Heat Firing Processes	HP	HC	Low	Moderate
By-Product Coke Ovens	HB	—	None	None
Uranium Refining Plants	LP	—	None	None
Phosphate Rock Preparation Plants	HB, LP	—	None	None
Metallic Mineral Mining and Benefication	LP			
Iron		—	None	None
Ferroalloy		PM	High	Moderate
Copper		—	None	None
Lead		PM	High	Moderate
Zinc		PM	High	Moderate
Aluminum		PM	High	Moderate
Uranium		—	None	None
Non-Metallic Mineral Mining and Benefication	LP			
Clay		—	None	None
Gypsum		—	None	None
Lime		—	None	None
Phosphate Rock (Mining)		—	None	None
Boron Compounds		—	None	None
Mica		—	None	None
Fluorspar		—	None	None
Sand and Gravel Processing Plants	LP	—	None	None
Stone Quarrying and Processing Plants	LP	PM	High	Moderate
Dry Cleaning	HB, HP	HC	Moderate	High
Solvent Metal Cleaning (Degreasing)	HB			
Cold Cleaners		—	None	None
Open Top Vapor Degreasers		HC	Moderate	High
Conveyorized Degreasing		HC	Moderate	High
Petroleum, Transportation and Marketing Industry				
Oil and Gas Production Fields (Leaks)	LP	—	None	None
Natural Gas/Natural Gasoline Processing Plants(Leaks)	HB	—	None	None
Service Station Loading and Unloading		—	None	None
Petroleum Refinery Miscellaneous Sources	HB	—	None	None
Crude Oil and Natural Gas Production Plants	LP	—	None	None

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[a] Flags:

HP - High population of receptors expected to be impacted by source based on expected source location.

LP - Low population of receptors expected to be impacted by source based on expected source location.

LB - Low background pollutant concentration expected because source is expected to be located in areas not impacted by similar pollutant emissions from other sources.

HB - High background pollutant concentrations expected because source is part of, or associated with, a larger facility emitting the same pollutant or is expected to be located in an area impacted by sources with similar pollutant emissions.

[b] Adjustments made only if high population or high background source was in top 1/3 of normalized concentration group and low population or low background source was in lower 1/3 of normalized group.

This is a simplistic way of addressing these issues but it is systematic and objective. Table 2-6 lists the sources that were considered for adjustment of their air quality impact rating.

2.5.6 Air Quality Impact Evaluation

The normalized concentration ratios and the impact ratings of each source category are given in Appendix B.

2.6 MOBILITY[a] AND COMPETITIVENESS EVALUATION

The CAA criterion of the mobility and competitive nature of industries and the need for nationally applicable emissions standards is the most difficult to address. The Congressional mandate resulting from this criterion can be interpreted to mean that consideration should be given to setting NSPS for those industries that, because of their highly mobile nature, could seek to locate in states or regions with less stringent air pollution control regulations. This would result in economic penalties to those states that have vigorous air quality management programs.

The difficulty with addressing this issue is that air pollution control regulations are only one of a large number of factors influencing industrial siting decisions. Considerations such as availability of land and water, labor pool, tax structures, workmen's compensation rules, capital requirements, resource requirements, market availability, and many others play significant roles in determining acceptable locations. It is also probably reasonable to assume that air pollution control, in general, plays only a secondary role in siting since it is more amenable to "technical fixes" than are the other problems. That this is the case has been reported elsewhere.[4,5]

Nevertheless, it is possible to say that, all other things being equal, differences among state air pollution control regulations can provide an incentive for an industry to move into or out of a state. In an attempt to address this issue for NSPS prioritization it was decided to group the source categories under study into two major divisions: (1) those that were not mobile and would have a difficult time moving out of a given state or location, and

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[a] The term "mobility" as used in this report refers only to an interpretation of the CAA regarding stationary source siting practices.

(2) those that were mobile and could make a relocation decision on the basis of air pollution control regulations.

A subjective review of the source categories under study was made to determine their mobility. A category was classified as non-mobile if it were either strongly tied to its raw material resource (e.g. mining operations) or if it were strongly tied to its market (e.g. service industries in urban areas). Sources that were not constrained by either of these considerations were classified as mobile by default.

It is fully recognized that this procedure does not address all of the issues affecting mobility nor does it consider conditions under which raw materials and finished products could be transported long distances as a result of the general availability of good transportation services throughout the country at acceptable costs. It does, however, identify the most significant constraints to mobility and provides a first order estimate as to which industries would not be likely to move solely because of air pollution regulations. It is expected that refinements to the information base would result in more sources being classified as non-mobile for reasons other than the two given above.

Table 2-7 gives the list of those sources classified as non-mobile, and the reason for this classification (raw-resource-linked or market-linked). It should be noted that, in contrast to the prior rankings by emissions and air quality impacts that are specific to pollutants, this ranking applies to source categories irrespective of the size and nature of pollutant emissions.

2.7 IMPACT EVALUATION

The previous discussions prescribe three different ways of establishing priorities for NSPS: on the basis of emissions, on the basis of potential air quality impacts, and on the basis of mobility and competitiveness. It is evident that there are numerous ways these three rankings can be combined and there are many perturbations that can be tested. It is therefore necessary to determine some measure of the impact of each prioritization scenario to serve as a point of comparison.

2.7.1 Emission Impact Evaluation

It is a straightforward process to identify the impact of any prioritization strategy on national emissions. Emissions are computed as a function

Table 2-7. Source Categories Classified as Non-Mobile

Source	Non-Mobility Flag[a]
Fossil Fuel Boilers (< 0.3×10^6 Btu/hr)[b]	K
Fossil Fuel Boilers ($0.3 - 10 \times 10^6$ Btu/hr)[b]	K
Fossil Fuel Boilers (10--250 $\times 10^6$ Btu/hr)	K
Mixed Fuel Boilers	B
Coal and Refuse	B
Oil and Refuse	B
Waste Oil Combustion Boilers[b]	K
Stationary Pipeline Compressor Engines	K
Stationary Internal Combustion Engines	K
Spark Ignition (Natural Gas)	K
Diesel and Dual Fuel	K
Industrial and Commercial Incineration	B
Municipal Incineration $\leq$ 50 Ton/Day	B
Sodium Carbonate (Soda Ash) Industry	L
Sodium Chloride Production Industry[b]	L
Fuel Conversion (Coal Gasification/Liquefaction)	L
Alfalfa Dehydrating Plants	L
Animal Feed Defluorination Plants	B
Cotton Ginning Plants	L
Direct Meat Firing Processes[b]	K
Fish Processing Plants[b]	L
By-Product Coke Ovens	L
Uranium Refining Plants	L
Asphalt Roofing Plants	K
Brick and Related Clay Products Plants	K
Clay and Fly-Ash Sintering Plants	L
Concrete Batching Plants[b]	K
Phosphate Rock Preparation Plants	L

[a] Flags: K - Source is market-locked
L - Source is land-locked (i.e., tied to resources)
B - Both K and L

[b] Minor Source Category

Table 2-7. (Contd)

Source	Non-Mobility Flag[a]
Metallic Mineral Mining and Benefication	L
Non-Metallic Mineral Mining and Benefication	L
Sand and Gravel Processing Plants	L
Stone Quarrying and Processing Plants	L
Dry Cleaning	K
Graphic Arts Industry	K
Industrial Surface Coating Industry	K
Solvent Metal Cleaning (Degreasing)[b]	K
Ship and Barge Transfer of Gasoline & Crude Oil	B
Bulk Gasoline Terminals (Loading Tank Trucks/Rail Cars)	K
Gasoline Bulk Plants (Storage and Transfer)[b]	K
Service Station Loading and Unloading[b]	K
Petroleum Refinery Miscellaneous Sources	L
Crude Oil and Natural Gas Production Plants	L

[a] Flags: K - Source is market-locked
L - Source is land-locked (i.e., tied to resources)
B - Both K and L

[b] Minor Source Category

of time using emission rates corresponding to state regulations (i.e., Es) for those sources that have not yet had an NSPS promulgated and emission rates corresponding to NSPS levels (i.e., En). It is then possible to evaluate the impact of a prioritization scenario by comparing the emission-vs-time projections with some desired level. This process is identical to that carried out in previous work[2] and the details will not be repeated again here.

For some pollutant prioritization schemes, it is desirable to distinguish large (Ts-Tn) values from moderate (Ts-Tn) values, etc. In order to make this distinction, a cumulative frequency distribution plot was developed for all major source-pollutant combinations and their associated potential emission reduction by application of NSPS in 1980; i.e., (Ts-Tn) in 1990. The frequency distribution, which appears in Fig. 2-4, indicates that there are a small number of source categories (i.e., 44) which account for the majority of the (Ts-Tn) potential emission reduction (i.e., >66,000 tons/year)and a large number of source categories (i.e., 200) which would yield very little emission reduction (i.e., <8,000 ton/yr) after application of NSPS.

Because of the skewness of the data, the class limits of High, Moderate and Low (Ts-Tn) were determined by inspection. One can see, from examining Fig. 2-4, that the High Class lower limit is selected, where the (Ts-Tn) level is experiencing a relatively large positive rate of change. The lower limit of the Moderate (Ts-Tn) was selected where the rate of change of (Ts-Tn) does not decrease significantly as the (Ts-Tn) level decreases. Table 2-8 gives the distribution data by (Ts-Tn) for each pollutant for High, Moderate and Low Ts-Tn classes.

2.7.2 Public Health and Welfare Impact Evaluation

It is not quite as simple to identify a measure of impact on public health and welfare (as measured by ambient air quality concentrations) of a prioritization strategy. Ideally, it would be desirable to have a measure of public exposure to high air pollutant concentrations. To do this would require the estimation of siting patterns of all the industrial source categories considered. The aggregate and non-site-specific nature of the Model IV data clearly does not allow this kind of estimate to be made. As a surrogate for this type of analysis, it appears reasonable to estimate the number of individual facilities that would be built over a given time span, that have the potential for high air quality impacts. Although this will not necessarily

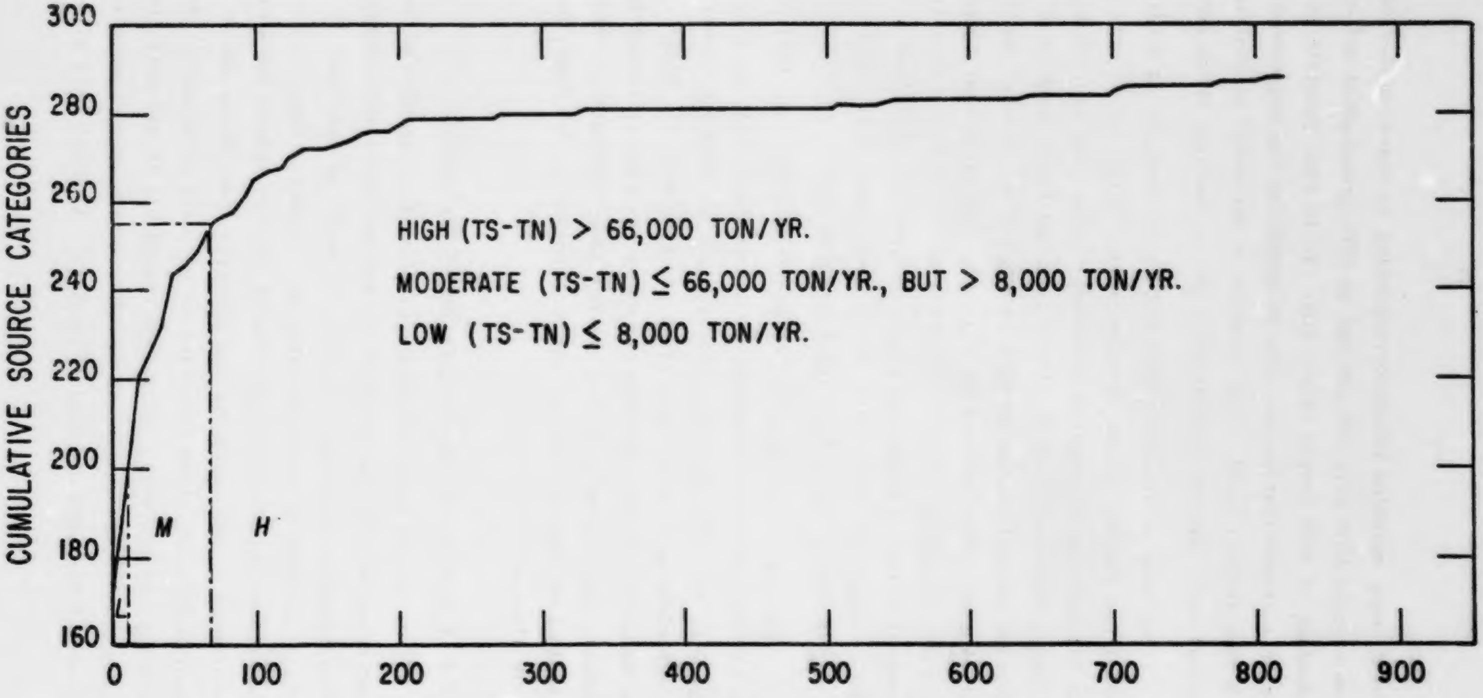
300
280
260
240
220
200
180
160
CUMULATIVE SOURCE CATEGORIES
0
100
200
300
400
500
600
700
800
900
L
M
H
HIGH (TS-TN) > 66,000 TON/YR.
MODERATE (TS-TN) ≤ 66,000 TON/YR., BUT > 8,000 TON/YR.
LOW (TS-TN) ≤ 8,000 TON/YR.
(TS-TN) x 10³ TON/YR POLLUTANT

Fig. 2-4

Table 2-8. Distribution of Source Categories by Pollutant and High, Moderate and Low (Ts-Tn).[a]

(Ts-Tn) Level[b]	Particulate			SO_2			NO_2		
	Mean (Tons/yr)	No. Source Category	Total (Ts-Tn) (Tons/yr)	Mean (Tons/yr)	No. Source Category	Total (Ts-Tn) (Tons/yr)	Mean (Tons/yr)	No. Source Category	Total (Ts-Tn) (Tons/yr)
High	233,800	11	2,571,200	111,500	4	446,100	391,800	5	1,959,000
Moderate	18,500	23	425,350	32,700	7	229,100	24,567	6	147,400
Low	1,700	65	110,100	1,800	16	28,000	1,800	6	11,000

(Ts-Tn) Level[b]	Hydrocarbons			CO			Pb		
	Mean (Tons/yr)	No. Source Category	Total (Ts-Tn) (Tons/yr)	Mean (Tons/yr)	No. Source Category	Total (Ts-Tn) (Tons/yr)	Mean (Tons/yr)	No. Source Category	Total (Ts-Tn) (Tons/yr)
High	277,700	15	4,166,000	385,800	9	3,472,500	--	--	--
Moderate	28,200	36	1,014,500	25,200	7	176,600	--	--	--
Low	2,500	38	93,000	2,100	8	16,470	1,000	11	10,500

(Ts-Tn) Level[b]	Fluorides			H_2S			H_2SO_4 Mist		
	Mean (Tons/yr)	No. Source Category	Total (Ts-Tn) (Tons/yr)	Mean (Tons/yr)	No. Source Category	Total (Ts-Tn) (Tons/yr)	Mean (Tons/yr)	No. Source Category	Total (Ts-Tn) (Tons/yr)
High	--	--	--	--	--	--	--	--	--
Moderate	16,400	1	16,400	42,300	1	42,300	41,900	1	41,900
Low	2,200	17	37,500	800	1	800	--	--	--

[a] Data rounded to nearest 100 ton/year

[b] High (Ts-Tn) > 66,000 ton/year of pollutant emission
Moderate (Ts-Tn) ≤ 66,000 ton/year but > 8,000 ton/year
Low (Ts-Tn) ≤ 8,000 ton/year

measure population exposure (since it cannot distinguish siting patterns relative to population distribution) it does provide a first-order estimate of the potential for population exposure. Also, an estimate of the number of plants of average size can easily be made with the Model IV information by Equation 2-11:

$$\text{Number of new plants} = \text{New and Replacement Industry Capacity/Average Plant Size} \qquad (2\text{-}11)$$

$$N = \left(B + C\right)/Z_{\text{average}}$$

B and C, and therefore N, are functions of time, but Z, a hypothetical source of average size, is assumed to be constant. Considering the short time period of this analysis (10 years), this appears to be a reasonable simplification. It should be noted that this number of plants can be calculated for those facilities with high, moderate, or low potential for air quality impacts as described in Section 2.5.

Figure 2-5 graphically illustrates how this impact measure can be evaluated. In the first time period before any standards are set, plants are being built without NSPS control levels and there is an increase in the number of facilities with high air quality impacts. As NSPS are set, the rate of increase of these high impact plants slows down as the new facilities are built to NSPS levels. Likewise, the number of new facilities with low air quality impacts increases. When all NSPS are set the rate of increase of high impact plants is zero and the number of plants with high air quality impacts remains fixed, representing facilities built prior to NSPS promulgation. The rate of increase of low impact plants now follows the total growth rate.

This graphic description is simplified in that it assumes all facilities not controlled by NSPS will have high air quality impacts, while those that have NSPS in effect will have low impacts. This is not the case in reality and was used here only to simplify the description. In practice, some facilities will have high air quality impacts (as defined by the algorithm used here) both before and after NSPS promulgation, since the NSPS may not reduce the ground level concentration enough.

This impact analysis lends itself well to readjusting priorities to account for undesirable impacts. The priority pollutant for readjustment can be determined by computing the number of facilities with high air quality impacts at some point in the future (1990 in this analysis) for each pollutant. This can be compared to some goal (e.g., a limit on the number of high impact

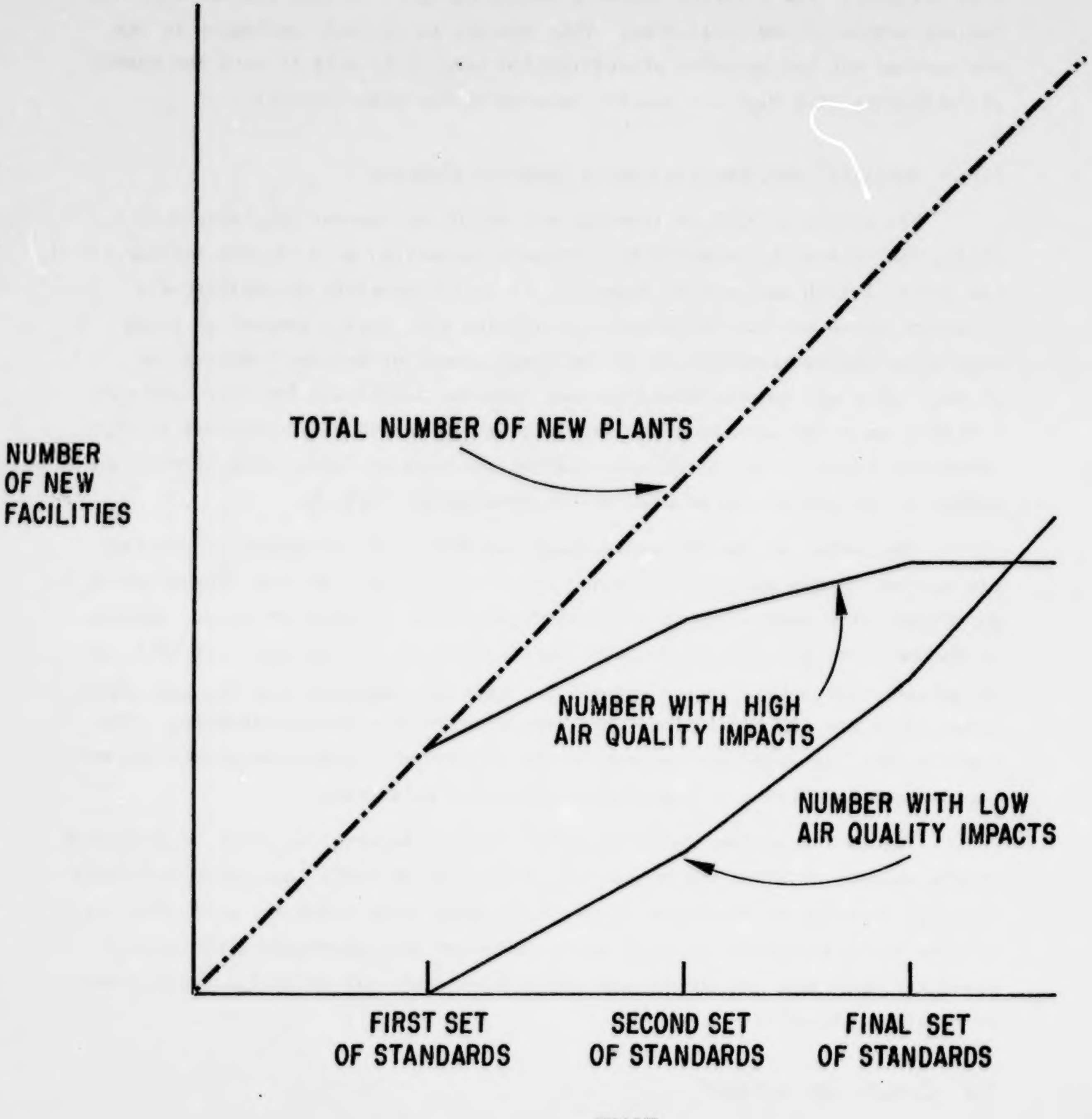

Fig. 2-5. Schematic of Impact of Priority Schedule on Facilities with High Air Quality Impacts.

facilities) and the priority determined by that pollutant which is furthest from its goal. The priority industry source category is then the one with the largest number of new facilities. This process is entirely analogous to the one carried out for emission prioritization (Sec. 2.4) only it uses the number of facilities with high air quality impacts as the prime variable.

2.7.3 Mobility[a] and Competitiveness Impact Evaluation

The effect of NSPS on removing air pollution control regulations as a siting factor must be measured by surrogate parameters in a fashion similar to the public health and welfare impacts. It is not possible to definitively determine where new and replacement facilities will locate because of state regulation differences because of the large number of factors involved in siting. What can be determined, however, are the facilities for which air pollution regulations have been removed as a siting consideration because of NSPS (assuming states do not promulgate regulations more stringent than NSPS). The number of new plants can be used as the measurement variable.

The number of new and replacement facilities is calculated as for the air quality impact analysis (Equation 2-11). The number is then classified as to whether they could move to avoid stringent state regulations (i.e., mobile) or whether they are tied to certain locations (i.e., non-mobile). As NSPS are promulgated for mobile source categories, they are switched into the non-mobile class since the air regulations have been removed as a siting variable. (The term "mobile" as used here relates to the ability of a source to locate new and replacement facilities in response to state air standards.)

Figure 2-6 schematically describes how the information could be presented. In the absence of NSPS, the number of new facilities built that could have made a siting decision on the basis of the difference among state air pollution regulations would increase. As NSPS are promulgated this decreases until all standards have been set and no new plants have state air pollution regulations as a siting parameter.

2.8 CAVEATS AND CAUTIONS

The implications of the NSPS program are significant, both to the regulated industries and to the EPA groups charged with carrying out the program.

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[a] The term "mobility," as used in this report, refers only to an interpretation of the CAA regarding stationary source siting practices.

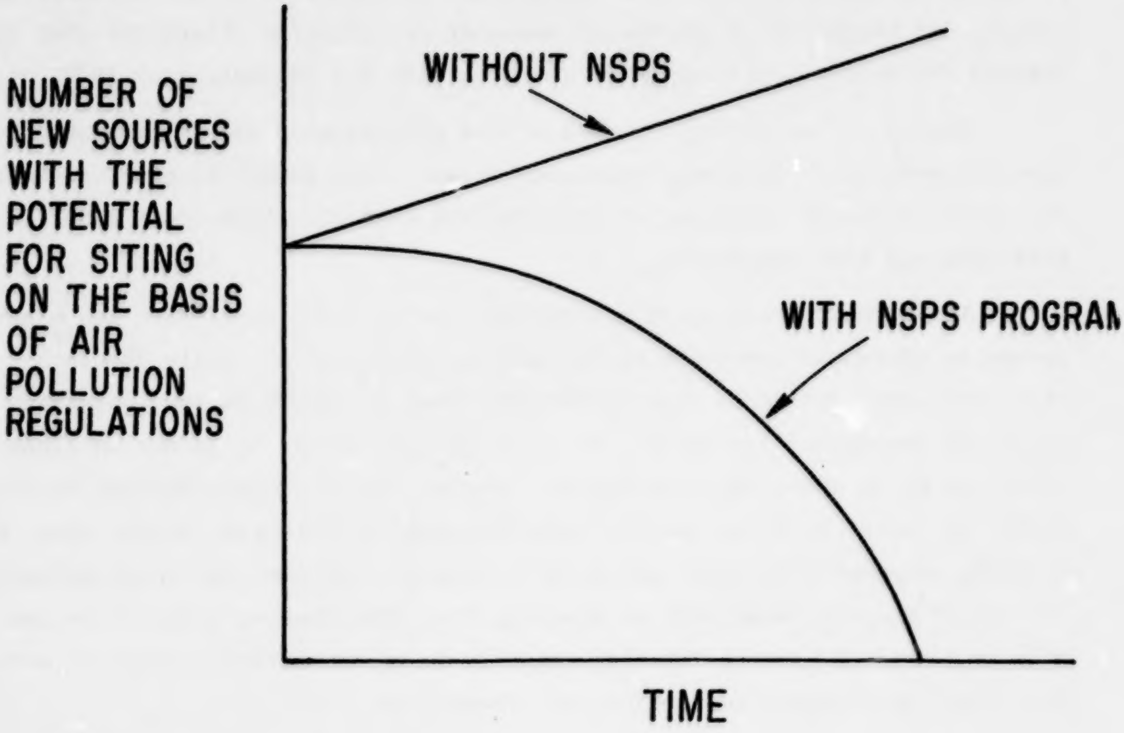

Fig. 2-6. Schematic of Impact of Priority Schedule on Mobility of Sources.

It therefore appears warranted to reemphasize the caveats and cautions expressed in the various portions of the methodology section.

First and foremost, this study was designed as a screening exercise to determine what areas should be looked at in more detail first. As such, it intentionally took a fairly cursory view of the details of each industrial process and made numerous simplifying assumptions in order to arrive at a manageable set of information upon which to develop program strategies. There are many other methods that could have been used and review and critique of this procedure is welcomed. The most significant contribution it was designed to achieve was to provide a systematic means of establishing priorities that addressed the criteria prescribed in the Clean Air Act Amendments of 1977.

Second, it is entirely possible that this base of information will be used for other work in other, unrelated areas. This should be done only with the utmost care and awareness of the time and resource limitations under which this data has been assembled.

Third, the screening of sources into major (>100 tons/year) and minor groups is extremely sensitive to the assumed source size. While it can be said with some confidence that those with order of magnitude less emissions (i.e. <10 tons/year) can clearly be classified as minor, it is not so clear in all cases as to where the intermediate sources (10-100 tons/year) can be classified. Although the minor sources were screered for a largest source size, it is to be expected that some sources have been grouped into the wrong category because of the unavailability of accurate size distribution data. This can only be corrected by more detailed analysis or by the identification of such data from the industry representatives themselves.

Fourth, the Model IV approach to emission computation addresses all the issues of interest (e.g., growth, replacement, varying emission rates, etc.) but it is only as good as the input data. Again, it is expected that there are holes or weak spots in the information. Updated data can easily be incorporated into the procedure for review and revision. The purpose of the more detailed studies are to provide this update.

Fifth, the air quality modeling procedure used here is extremely crude and ignores site-specific features such as terrain, meteorology, background, etc. It was for this reason that the analysis generated only a grouping (high, moderate, low) rather than a concentration number. The use of the procedure in a relative rather than an absolute screening was also the result of recognized weaknesses in the ability to predict expected concentrations with the limited data available. It does, however, provide a first approximation of air quality impacts.

Sixth, there are a large number of possible perturbations to the prioritization scheme that can be tested by applying different weights to the various criteria (emissions, air quality, mobility), by adding other criteria (e.g. economics, equipment availability, enforceability), by adding subjective evaluation of certain source categories, and many others. Time and resources did not permit a comprehensive evaluation of all the possibilities; only the most obvious prioritizations were tried. Also, there was a distinct decision not to reduce the priority schemes under each of the three criteria to a single numerical rank. It is the opinion of the authors that this obscures valuable information required by the decision-makers. It is intentional that the result of several schemes and their impacts are presented for review rather than a single ranking.

Finally, there are many criticisms that can be leveled at this methodology and at its information base. Most of the obvious ones have already been acknowledged and attempts have been made to deal with them within the time and resource constraints available. Continuing criticism with corresponding suggestions for improvements are always welcome.

In summary, data evaluation for individual sources should not be viewed or referenced out of context of this work. The value of this work for the decision maker lies in the context of the total analysis. The worth of the impact analysis is in relative rather than absolute measures. Simplifying assumptions and the algorithms constructed for the analysis were equally applied to all categories and therefore it is believed that the relative measure of the parameter yields a meaningful picture of the measure of impact by the three CAA criteria.

3. PRIORITIZATION SCENARIOS

There are many ways to apply the prioritization methodology to develop an ordered list of sources for NSPS control. The approach taken here is first to review each pollutant separately to determine the unique characteristics of the sources. Next, the pollutants will be reviewed collectively and priorities among pollutants determined.

Several prioritization scenarios will appear frequently. The two bounding cases consist of setting no NSPS at all in the study period (1980-1990) and setting all NSPS in 1980. Although neither case is realistic, they do provide the limits on the best and the least that can be achieved under an NSPS program.

In addressing the criteria of the CAA it is possible to define many scenarios. For the purpose of this analysis the baseline strategy (referred to as the Baseline Strategy) consists of the following considerations: (1) Onlv major sources (≥ 100 ton/yr pollutant of one or more uncontrolled pollutants) are considered for NSPS; (2) All sources with high mass emissions (Ts-Tn) are considered before those with moderate mass emissions, which in turn are all considered before those with low mass emissions; (3) Sources with high air quality impact are considered before those with moderate impacts, which in turn are all considered before those with low air quality impact,; and (4) Sources that are mobile are considered before nonmobile sources. This leads to the following groups in the order in which they are considered:

(a) High (Ts-Tn), High Air Quality Impact, Mobile, (Ts-Tn) Rank
(b) High (Ts-Tn), High Air Quality Impact, Nonmobile, (Ts-Tn) Rank
(c) High (Ts-Tn), Moderate Air Quality Impact, Mobile, (Ts-Tn) Rank
(d) High (Ts-Tn), Moderate Air Quality Impact, Nonmobile, (Ts-Tn) Rank
(e) High (Ts-Tn), Low Air Quality Impact, Mobile, (Ts-Tn) Rank
(f) High (Ts-Tn), Low Air Quality Impact, Nonmobile, (Ts-Tn) Rank
(g) - (l) Repeat for Moderate (Ts-Tn)
(m) - (r) Repeat for Low (Ts-Tn)

Each of the subgroups (a) through (r) are finally ranked by (Ts-Tn), allowing the computer program to select sources off the prioritized list in the multipollutant analysis. This is, of course, only one of many possitilibies that can easily be tested with the methodology. Some of these perturbations will be presented here.

3.1 POLLUTANT SPECIFIC - MAJOR SOURCE CATEGORIES

3.1.1 Particulate Matter

There were 88 major particulate emission source categories evaluated. This amounted to 56 percent of all major source categories evaluated. A major pollutant emission source is a source which has the potential of emitting a minimum of 100 tons per year of one or more specified pollutants without application of emission control techniques or processes.

The nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for both major and minor particulate emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state particulate emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide particulate emissions. The state emission factor limitation (Es) used was, in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Hypothetical average source sizes for each major particulate emission source category ranged from approximately 1800 tons product per year to over 5 million tons product per year. Uncontrolled particulate emissions from an average hypothetical source size in each particulate emission source category ranged from 0.4 tons particulate per year to 85,000 tons particulate per year.

During the 1980-1990 time period the new growth capacity was represented by the number of hypothetical new sources of average size. For the ten year period the number of new hypothetical sources for the major particulate emission source categories ranged from as few as one source per category to over 8,000 sources per category.

The nationwide particulate emissions computed for 1980 as allowed by 1975 state emission factor limitations was 9 million tons particulate matter per year for the 88 major particulate emission source categories evaluated. Approximately 16 source categories accounted for 90 percent of these particulate emissions with 3 source categories accounting for nearly 53 percent of the emissions.

The nationwide particulate source category production capacities were also computed for 1990. Nationwide particulate emissions for 1990 were computed assuming state emission limitation factors were in force during the 1980-1990 time period. Nationwide particulate emissions were also computed assuming application of an emission limitation reflecting a condition of best anticipated control (E_n), which would be applied to new or modified source construction during the same ten year period. The difference in the national emissions based on the state limitation and the more restrictive new and modified source limitation (Ts-Tn) in 1990 was then computed. The anticipated 1990 particulate emission reductions (Ts-Tn) by the application of (En) beginning in 1980 ranged from 4 tons per year to 778,000 tons per year. The (Ts-Tn) values for major particulate matter source categories is listed in Table A-3, Appendix A.

The air quality impact of each of the 88 major particulate emission source categories was evaluated. Actually 118 individual particulate emission source categories were evaluated for air quality impact. However, 30 source categories were actually unit operations of a larger representative source category and were aggregated for growth and mass emission purposes. The computer dispersion model program calculated the air quality impact for the aggregated source category. A typical or average source size was selected for each source category for the dispersion analysis. The maximum ground level concentration (X) was computed based both on the state emission factor limitation (Es) and the best level of anticipated control (En). The maximum ground level concentrations for both (Es) and (En) were compared after normalizing (dividing) by the appropriate ambient threshold value for particulate matter. These values were then ranked by order of magnitude and statistically divided into three groups of High, Moderate and Low air quality impact.

Among the 88 major particulate emission source categories evaluated, 24 source categories or 27 percent had a High air quality impact resulting from the state emission limitation (Es). For this High impact group, 17 or 71 percent of the particulate emission source categories were reduced to a Moderate or Low air quality impact by the application of the best anticipated emission limitation (En). A total of 10 or 12 percent of the particulate emission source categories had a Low air quality impact based on state emission limitation factors.

Of the 88 major particulate emission source categories, 37 or 43 percent were considered to be non-mobile and non-competitive based on either market or raw material ties. Therefore 50 particulate emission source categories or 58 percent of all the major particulate emission source categories would be considered mobile and competitive and would tend to locate in states with less restrictive emission limitations, assuming all other mobility and competition considerations allowed the source the necessary flexibility in source siting.

Table 3.1.A gives the prioritized schedule for all particulate emission source categories under the Baseline Strategy described above. Assuming implementation of this schedule nationwide emissions over time are shown in Fig. 3.1. For purposes of comparison, emissions are also displayed for the following cases:

- All NSPS are set in 1980, that is, En becomes the applicable emission limitation for all sources in 1980. This case represents a lower bound to achievable emissions.
- No NSPS are set, that is, Es continues to be the applicable emission limitation for all sources. This case represents an upper bound for nationwide particulate emissions.

Examination of this figure shows that nationwide particulate emissions will continue to increase over time if no NSPS are set and will continue to decrease with time by the application of NSPS (En) regardless of the standard setting rate or prioritized scheme. This insensitivity to the prioritization scheme is to be expected given the short time period in which the CAA requires standards to be set. Beyond mid-1982, both the Base Strategy and the lower bound are almost parallel because in both cases all new and replacement sources must meet the same limits. By 1990, the difference in emissions between the Base Strategy and the lower bound is small compared to the difference between the upper and lower bounds. That is, by 1990 the Base Strategy produces almost the same results in terms of emission reductions as setting all standards in 1980.

The figure also shows that after 1980, emissions drop off signíficently by the Base Strategy and all-NSPS case. This is the result of having mass emissions rather than mobility and air quality impact determine the prioritized schedule. Source categories with relatively large national emission totals are regulated earlier than source categories with small totals because the High (Ts-Tn) source categories have first priority.

Several points should be made about the order of several source categories. Mining, Incineration, and Metallurgical sources occur early in the schedule because of their high mass emission reduction potential. It should be noted that the mining operations include emissions from fugitive sources as well as process sources. In some mining source categories, fugitive emissions are very large. Mining operations also head the list because they have high air quality impacts.

Table 3.1.C compares the 1990 air quality impacts of the three NSPS schedules in terms of the number of new and modified sources having high, moderate, and low air quality impacts. Table 3.1.D compares the mobility and competitiveness impacts of the three schedules in terms of the number of new and modified sources that could have moved under each schedule, that is, the number that were mobile prior to being regulated by an NSPS. The number of new and modified sources that are either non-mobile initially or that become non-mobile when an NSPS is set is also given.

TABLE 3-1-A PRIORITIZED NSPS SCHEDULE FOR PARTICULATES[a]

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0					
	1.00	(AGG) NON-METALLIC MINING - CLAY	35.519989	41 F01	N1
	2.00	PHOSPHATE ROCK (MINING)	6.000000	44 F01	N1
	3.00	SAND & GRAVEL PROCESS	0.420000	40 A02	N2
	4.00	(AGG) NON-METALLIC MINING - GYPSUM	5.099999	42 F01	N2
	5.00	INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)	0.065000	11 B04	N2
	6.00	METALIC MINERALS MINING (COPPER)	0.070000	43 E01	N2
	7.00	(AGG) NON-METALLIC MINING - LIME	6.299999	43 F01	N1
	8.00	BY-PRODUCT COKE OVEN	0.215000	50 A10	N1
	9.00	(AGG) FEED AND GRAIN MILL INDUSTRY	0.193000	30 E01	N4
	10.00	(AGG) PHOSPHATE ROCK PREPARATION PLANTS	1.389999	41 D01	N4
	11.00	PLYWOOD MANUFACTURING PLANT	0.001300	80 B01	N2
	12.00	GREY IRON FOUNDRIES (ELECTRIC ARC)	0.070000	50 C02	N3
	13.00	(AGG) SECONDARY ALUMINUM PLANTS	4.309999	51 B12	N2
	14.00	WHISKEY	0.002200	30 D08	N2
	15.00	POTASH	0.660000	20 A18	N2
1980.5					
	1.00	METALIC MINERALS MINING (URANIMUM)	0.110000	47 E01	N3
	2.00	FLY-ASH SINTERING (SINTERING)	1.099999	40 D17	N2
	3.00	METALIC MINERALS MINING (FERROALLOY)	0.600000	42 E01	N2
	4.00	(AGG) NON-METALLIC MINING - BORON COMPOUNDS	1.059999	45 F01	N1
	5.00	AMMONIUM SULFATE	1.000000	30 D20	N4
	6.00	STEEL FOUNDRIES (ELECTRIC ARC)	0.260000	50 D01	N5
	7.00	VEGETABLE OIL MFG.	0.630000	30 D11	N4
	8.00	BEER PROCESSING PLANTS	0.270000	30 D09	N4
	9.00	PHTHALIC ANHYDRIDE PLANTS (OXYLENE PROCESS)	2.400000	20 C26	N4
	10.00	METALIC MINERALS MINING (IRON ORE)	0.500000	41 E01	N4
	11.00	METALIC MINERALS MINING (ALUMINUM)	0.110000	46 E01	N5
	12.00	MUNICIPAL INCINERATION < 50T/D	0.300000	10 B03	N5
	13.00	METALIC MINERALS MINING (LEAD MINING)	0.700000	44 E01	N4
	14.00	METALIC MINERALS MINING (ZINC MINE & CRUSHING)	0.700000	45 E01	N4
	15.00	GLASS MANUFACTURING INDUSTRY (SODA-LIME GLASS)	0.022000	40 D07	N6
1981.0					
	1.00	GYPSUM MANUFACTURING PLANTS (CALCINER)	0.100000	40 D11	N6
	2.00	SODIUM CARBONATE PLANT (NATURAL PROCESS)	0.450000	20 C24	N6
	3.00	PESTICIDES MANUFACTURING	0.100000	55 A01	N2
	4.00	(AGG) CASTABLE REFRACTORY PLANTS	8.400000	40 D08	N1
	5.00	GREY IRON FOUNDRIES (REVERBERATORY)	0.100000	50 C03	N3
	6.00	BORAX BORIC ACID	1.620000	20 A15	N2
	7.00	PHTHALIC ANHYDRIDE PLANTS (NAPTHALENE PROCESS)	0.990000	20 C25	N3
	8.00	(AGG) NON-METALLIC MINING - FLUORSPAR	6.000000	47 F01	N2
	9.00	STONE QUARRYING AND PROCESSING	2.599999	40 A01	N1
	10.00	POLYPROPLYENE	0.030000	20 B07	N5
	11.00	STEEL FOUNDRIES (OPEN HEARTH)	0.220000	50 D02	N5
	12.00	POLYESTER RESIN	0.350000	20 B19	N5
	13.00	NITRATE FERTILIZER (AMMONIUM NITRATE) PLANTS	0.180000	30 A05	N4
	14.00	EXPLOSIVE IND (HIGH EXPLOSIVES)	0.260000	20 C17	N5
	15.00	STARCH MFGR	0.020000	30 D18	N5

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[a] See Table 3-1-B for Definition of Terms

TABLE 3-1-A[a] (Cont'd)

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1981.5					
	1.00	SYNTHETIC FIBERS INDUSTRY (DACRON POLYESTER)	0.350000	20 B08	N4
	2.00	HYDROGEN FLUORIDE	1.009999	20 A17	N4
	3.00	CARBON BLACK (FURNACE PROCESS)	1.099999	20 C03	N5
	4.00	MINERAL WOOL MFG	3.629999	40 D13	N4
	5.00	(AGG) SECONDARY COPPER PLANTS (CONVERTER SMELTING)	0.330000	56 B01	N4
	6.00	POLYETHYLENE (LOW DENSITY)	0.045000	20 B04	N5
	7.00	SYNTHETIC FIBER INDUSTRY (NYLON)	0.750000	20 B09	N4
	8.00	(AGG) SECONDARY COPPER PLANTS (BLAST FURNACE)	0.198000	57 B01	N5
	9.00	PERLITE (VERTICAL FURNACE)	0.210000	40 D12	N5
	10.00	PHOSPHORIC ACID PLANTS (THERMAL PROCESS)	0.134000	20 A10	N5
	11.00	EXPLOSIVE IND (LOW EXPLOSIVES)	0.380000	20 C18	N5
	12.00	CHARCOAL PLANTS	4.000000	20 C16	N4
	13.00	CHEMICAL WOOD PULPING IND. (ACID SULFITE)	2.000000	80 A04	N4
	14.00	(AGG) SECONDARY ZINC SMELTERS (RETORT REDUCTION & KETTLE FURNACES	2.580000	51 E01	N4
	15.00	(AGG) SECONDARY ZINC SMELTERS (HORIZ & REVERB FURNACES)	0.799000	51 E02	N4
1982.0					
	1.00	FIBERGLASS MFG. PLANTS (WOOL PROCESSING)	9.299999	40 D14	N4
	2.00	FIBERGLASS MFG. PLANTS (TEXTILE PROCESSING)	4.400000	40 D06	N4
	3.00	CERAMIC CLAY MFG	18.000000	40 D10	N4
	4.00	SYNTHETIC RUBBER IND. (STYRENE-BUTADIENE) (SBR)	0.120000	20 D01	N5
	5.00	GREY IRON FOUNDRIES (CUPOLA)	0.200000	50 C04	N5
	6.00	MIXED FUEL BOILERS (COAL & REFUSE)	0.300000	10 A06	N5
	7.00	MIXED FUEL BOILERS (OIL & REFUSE)	0.200000	10 A07	N5
	8.00	COTTON GINNING	0.480000	30 B01	N4
	9.00	URANINUM REFINING	0.010000	50 F01	N5
	10.00	(AGG) ASPHALT ROOFING PLANTS	0.960000	41 B01	N4
	11.00	ALFALFA DEHYDRATING PLANTS	0.236000	30 D01	N5
	12.00	(AGG) TUNNEL KILNS(COAL),DRYERS AND STORAGE	1.299999	45 D12	N4
	13.00	(AGG) TUNNEL KILNS(OIL),DRYERS AND STORAGE	1.299999	45 D11	N4
	14.00	INDUSTRIAL INCINERATION (IND ORGANIC LIQUID WASTE INC)	5.400000	12 B04	N4
	15.00	(AGG) CLAY SINTERING PLANTS	1.099999	40 D16	N5
1982.5					
	1.00	(AGG) PERIODIC KILNS(OIL), DRYERS AND STORAGE	1.360000	46 D11	N4
	2.00	(AGG) PERIODIC KILNS(COAL),DRYERS AND STORAGE	1.299999	46 D12	N4
	3.00	(AGG) TUNNEL KILNS(GAS),DRYERS AND STORAGE	1.299999	45 D10	N4
	4.00	(AGG) PERIODIC KILNS(GAS),DRYERS AND STORAGE	1.299999	46 D10	N4
	5.00	ANIMAL FEED DEFLUORINATION	0.062500	30 D10	N5
	6.00	INDUSTRIAL BOILERS (10-250X10E6 BTU/HR)	0.403900	10 A03	N4
	7.00	UREA	1.360000	20 B21	N6
	8.00	DETERGENT MANUFACTURING PLANTS	0.450000	20 C10	N6
	9.00	GLASS MANUFACTURING INDUSTRY (LEAD GLASS)	0.240000	40 D19	N6
	10.00	STYRENE	0.004000	20 C45	N6
	11.00	ACETIC ANHYDRIDE	0.001000	20 C48	N6
	12.00	STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)	5.139999	10 C02	N6
	13.00	STATIONERY PIPELINE COMPRESSOR ENGINES	0.830000	11 C01	N6

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[a] See Table 3-1-B for Definition of Terms

Table 3.1.B Definitions Applicable to Priorized NSPS Schedules.

Cumulative Effort

One effort level is defined as the effort expended for the first pollutant standard set for a source category. For each additional pollutant standard set for the same source category, it is assumed that 1/4 of an effort level will be expended.

Therefore the number of effort levels expended in any 6 month time period will usually be less than the total number of source category-pollutant standards set. The greater the number of multi-pollutant source categories for standard setting in a time period the greater the difference between the cumulative effort level and the actual count of source category-pollutant standards.

Standard Used

This value reflects the best anticipated level of emission reduction (i.e., the NSPS allowable emission (En) in lb pollutant/unit of production).[b]

Code

The five-character identifier specifying a unique source category. This identifier can be used to cross reference source category data from different data listings.

M/N Flag

M-Mobile Source Category

N-Non-mobile Source Category

Numerical Flag

	Category Air Quality Impact Change[a]	
Flag	Es	En
1	High	High
2	High	Moderate
3	High	Low
4	Moderate	Moderate
5	Moderate	Low
6	Low	Low

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[a] The numerical air quality impact flag denotes the change in air quality impact from the state emission limitation (Es) to the NSPS limitation (En)

[b] See Table A-3 for emission units for each source category.

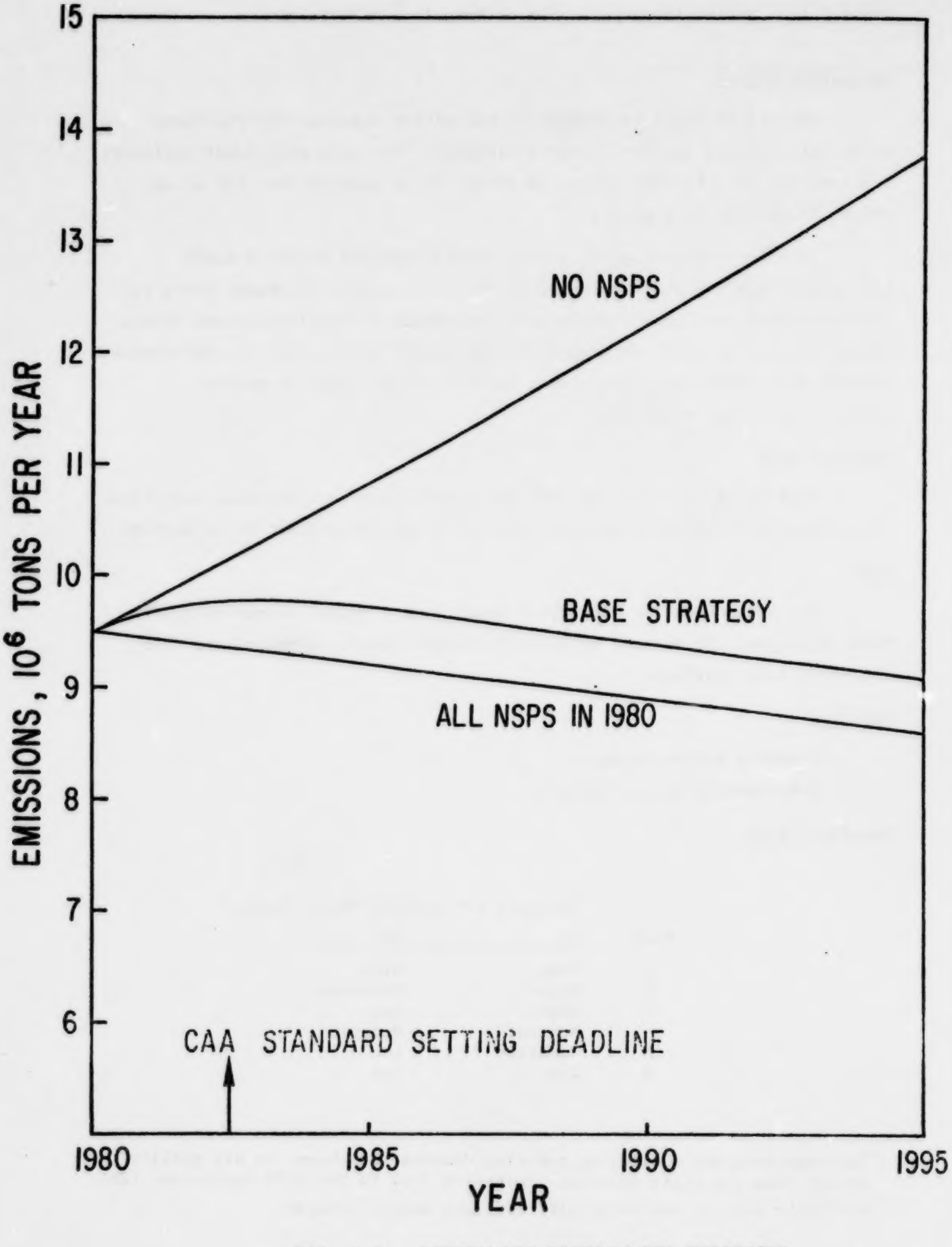

FIG. 3.1. NATIONWIDE PARTICULATE EMISSIONS

Table 3.1.C Particulate Air Quality Impacts of NSPS Strategies

Standard Setting Strategy	New and Modified Sources in 1990			
	Number with High Air Quality Impact	Number with Moderate Air Quality Impact	Number with Low Air Quality Impact	Total Number
No NSPS	5474	20,019	5,336	30,829
Baseline	2291	21,120	7,418	30,829
All set in 1980	2281	20,968	7,580	30,829

Table 3.1.D Mobility/Competiveness Impacts of NSPS Strategies for Particulates

Standard Setting Strategy	New and Modified Sources in 1990		
	Number of Sources that Could Have Moved	Number of Sources Precluded from Moving	Total Number
No NSPS	14,339	16,490	30,829
Baseline	751	30,078	30,829
All set in 1980	0	30,829	30,829

3.1.2 Sulfur Dioxide

There were 28 major sulfur dioxide emission source categories evaluated. This amounted to 18 percent of all major source categories evaluated. A major pollutant emission source is a source which has the potential of emitting a minimum of 100 tons per year of one or more specified pollutants without application of emission control techniques or processes.

The nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for both major and minor sulfur dioxide emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state sulfur dioxide emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide sulfur dioxide emissions. The state emission factor limitation (Es) used was, in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Hypothetical average source sizes for each major sulfur dioxide emission source cateogry ranged from approximately 6,000 tons product per year to over 700,000 tons product per year. Uncontrolled sulfur dioxide emissions from an average hypothetical source size in each major source dioxide emission source category ranged from 400 pounds sulfur dioxide per year to over 6,000 tons sulfur dioxide per year.

During the 1980-1990 time period the new growth capacity was represented by the number of hypothetical new sources of average size. For the ten year period the number of new hypothetical sources for the major sulfur dioxide emission source categories ranged from as few as two sources per category to over 4,000 sources per category.

The nationwide sulfur dioxide emissions computed for 1980 as allowed by 1975 state emission factor limitations was over 8,000,000 tons sulfur dioxide per year for the 28 major sulfur dioxide emission source categories evaluated. Only 2 source categories accounted for approximately 90 percent of these sulfur dioxide emissions with 1 source category accounting for nearly 89 percent of the emissions.

The nationwide sulfur dioxide source category production capacities were also computed for 1990. Nationwide sulfur dioxide emissions for 1990 were computed assuming state emission limitation factors were in force during the 1980-1990 time period. Nationwide sulfur dioxide emissions were also computed assuming application of an emission limitation reflecting a condition of best anticipated control (E_n), which would be applied to new or modified source contruction during the same ten year period. The difference in the national emissions based on the state limitation and the more restrictive new and modified source limitation (Ts-Tn) in 1990 was then computed. The anticipated 1990 sulfur dioxide emission reductions (Ts-Tn) by the application of (En) beginning in 1980 ranged from 20 tons per year to over 1,000,000 tons per year. The (Ts-Tn) values for major sulfur dioxide source categories is listed in Table A-3, Appendix A.

The air quality impact of each of the 28 major sulfur dioxide emission source categories was evaluated. Actually a higher number of individual sulfur dioxide emission source categories were evaluated for air quality impact. Seven source categories were made up of two or more unit operations and were aggregated for growth and mass emission purposes. The computer dispersion model program calculated the air quality impact for each of the unit operations and computed a maximum air quality impact for the aggregated source category for the dispersion analysis. The maximum ground level concentration (χ) was computed based both on the state emission factor limitation (Es) and the best level of anticipated control (En). The maximum ground level concentration (χ) for both (Es) and (En) were compared after normalizing (dividing) by the appropriate ambient threshold value for sulfur dioxide. The values were then ranked by order of magnitude and statistically divided into three groups of High, Moderate and Low air quality impact.

Among the 28 major sulfur dioxide emission source categories evaluated, 7 source categories or 25 percent had a High air quality impact resulting from the state emission limitation, (Es). For this High impact group 4 or 57 percent of the sulfur dioxide emission source categories were reduced to a Moderate or Low air quality impact by the application of the best anticipated emission limitation, En. A total of 36 percent or 10 sulfur dioxide emission source categories had a Low air quality impact based on state emission limitation factors.

Of the 28 major sulfur dioxide emission source categories, 15 or 54 percent were considered to be non-mobile and non-competitive based on either market or raw material ties. Therefore, 13 sulfur dioxide emission source categories or 46 percent of the major sulfur dioxide emission source categories would be considered mobile and competitive and would tend to locate in states with less restrictive emission limitations, assuming all other mobility and competition considerations allowed the source the necessary flexibility in sourc siting.

Table 3.2.A gives the prioritization schedule for all sulfur dioxide emission source categories under the Baseline Strategy described above. Nationwide sulfur dioxide emissions as a function of time assuming implementation of this schedule are shown in Fig. 3.2. For purposes of comparison, the emissions are also displayed for the following limiting cases:

- All NSPS are set in 1980, that is, En becomes the applicable emission limitation for all sulfur dioxide sources in 1980. This case represents a lower bound to achievable sulfur dioxide.
- No NSPS are set, that is, Es continues to be the applicable emission limitation for all sources. This case represents an upper limit for nationwide sulfur dioxide emissions.

Examination of Fig. 3.2 shows that nationwide sulfur dioxide emissions will continue to increase with time by the application of En regardless of the standard setting rate and prioritization scheme. This insensitivity to the prioritization scheme is to be expected given the short time frame in which the Clean Air Act requires standards to be set. Beyond mid-1982, both the Base Strategy and the lower bound case are almost parallel, because in both cases all new and replacement sources must meet the same emission limitations.

Figure 3.2 shows that as a result of the prioritization schedule the sulfur dioxide emissions have a steady increase which parallels the lower case boundary. The base strategy is very close to the case of all NSPS set in 1980 because overall reduction in mass emissions dominates the prioritization schedule.

Further examination of Fig. 3.2 shows that in 1982 the prioritization schedule only provides a reduction of less than 125,000 tons per year sulfur dioxide from the level allowed by state emission limitations. By 1985 this reduction in annual emissions has increased to over 250,000 tons sulfur dioxide per year and by 1990 to over 500,000 tons of sulfur dioxide per year.

Examination of Table 3.2.A indicates that standards are first set for High Explosive Industry, Chemical Wood Pulping and High Btu Fuel Conversion. These sulfur dioxide major emission source categories have high to moderate air quality impact. On the other hand, standards are set for Tunnel Kilns, Stationary I.C. Engines and Periodic Kilns last because these sources have low (Ts-Tn), low air quality impact and are non-mobile.

Table 3.2.B compares the 1990 air quality impacts of the three NSPS schedules in terms of the number of new and modified sources having high, moderate, and low air quality impacts. Table 3.2.C compares the mobility and competitiveness impacts of the three schedules in terms of the number of new and modified sources that could have moved under each schedule, that is, the number that were mobile prior to being regulated by an NSPS. The number of new and modified sources that are either non-mobile initially or that become non-mobile when an NSPS is set is also given.

TABLE 3-2-A PRIORITIZED NSPS SCHEDULE FOR SULFUR DIOXIDE[a]

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0					
	1.00	EXPLOSIVE IND (HIGH EXPLOSIVES)	6.000000	20 C17	N2
	2.00	CHEMICAL WOOD IND. (NSSC)	3.099999	80 A03	N2
	3.00	FUEL CONVERSION HIGH BTU COAL GASIFICATION	1.559999	21 C20	N4
	4.00	INDUSTRIAL BOILERS (10-250X10E6 BTU/HR)	1.500000	10 A03	N4
	5.00	(AGG) SECONDARY COPPER PLANTS (CONVERTER SMELTING)	87.000000	58 B01	N6
1980.5					
	1.00	CHEMICAL WOOD PULPING IND. (ACID SULFITE)	3.099999	80 A04	N2
	2.00	BY-PRODUCT COKE OVEN	4.020000	50 A10	N1
	3.00	ETHYLENE	0.014900	20 C31	N5
	4.00	EXPLOSIVE IND (LOW EXPLOSIVES)	5.549999	20 C18	N4
	5.00	MIXED FUEL BOILERS (COAL & REFUSE)	0.140000	10 A06	N5
1981.0					
	1.00	GLASS MANUFACTURING INDUSTRY (SODA-LIME GLASS)	0.120000	40 D07	N6
	2.00	(AGG) SECONDARY COPPER PLANTS (BLAST FURNACE)	7.679999	57 B01	N2
	3.00	(AGG) CRUDE OIL AND NATURAL GAS PRODUCTION PLANTS	0.011000	71 E01	N1
	4.00	INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)	2.379999	11 B04	N1
	5.00	FIBERGLASS MFG. PLANTS (WOOL PROCESSING)	0.005000	40 D14	N5
1981.5					
	1.00	PHTHALIC ANHYDRIDE PLANTS (OXYLENE PROCESS)	9.400000	20 C26	N4
	2.00	MUNICIPAL INCINERATION < 50T/D	0.030000	10 B03	N5
	3.00	(AGG) TUNNEL KILNS(COAL),DRYERS AND STORAGE	0.720000	45 D12	N5
	4.00	STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)	16.000000	10 C02	N4
	5.00	(AGG) PERIODIC KILNS(COAL),DRYERS AND STORAGE	1.200000	46 D12	N5
1982.0					
	1.00	GLASS MANUFACTURING INDUSTRY (LEAD GLASS)	0.080000	40 D19	N6
	2.00	MINERAL WOOL MFG	0.0	40 D13	N6
	3.00	ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE	0.004000	20 C35	N6
	4.00	MIXED FUEL BOILERS (OIL & REFUSE)	0.010000	10 A07	N6
	5.00	STATIONERY PIPELINE COMPRESSOR ENGINES	5.000000	11 C01	N6
1982.5					
	1.00	(AGG) TUNNEL KILNS(OIL),DRYERS AND STORAGE	0.040000	45 D11	N6
	2.00	STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)	0.0	10 C01	N6
	3.00	(AGG) PERIODIC KILNS(OIL), DRYERS AND STORAGE	0.060000	46 D11	N6

[a] See Table 3-1-B for Definition of Terms

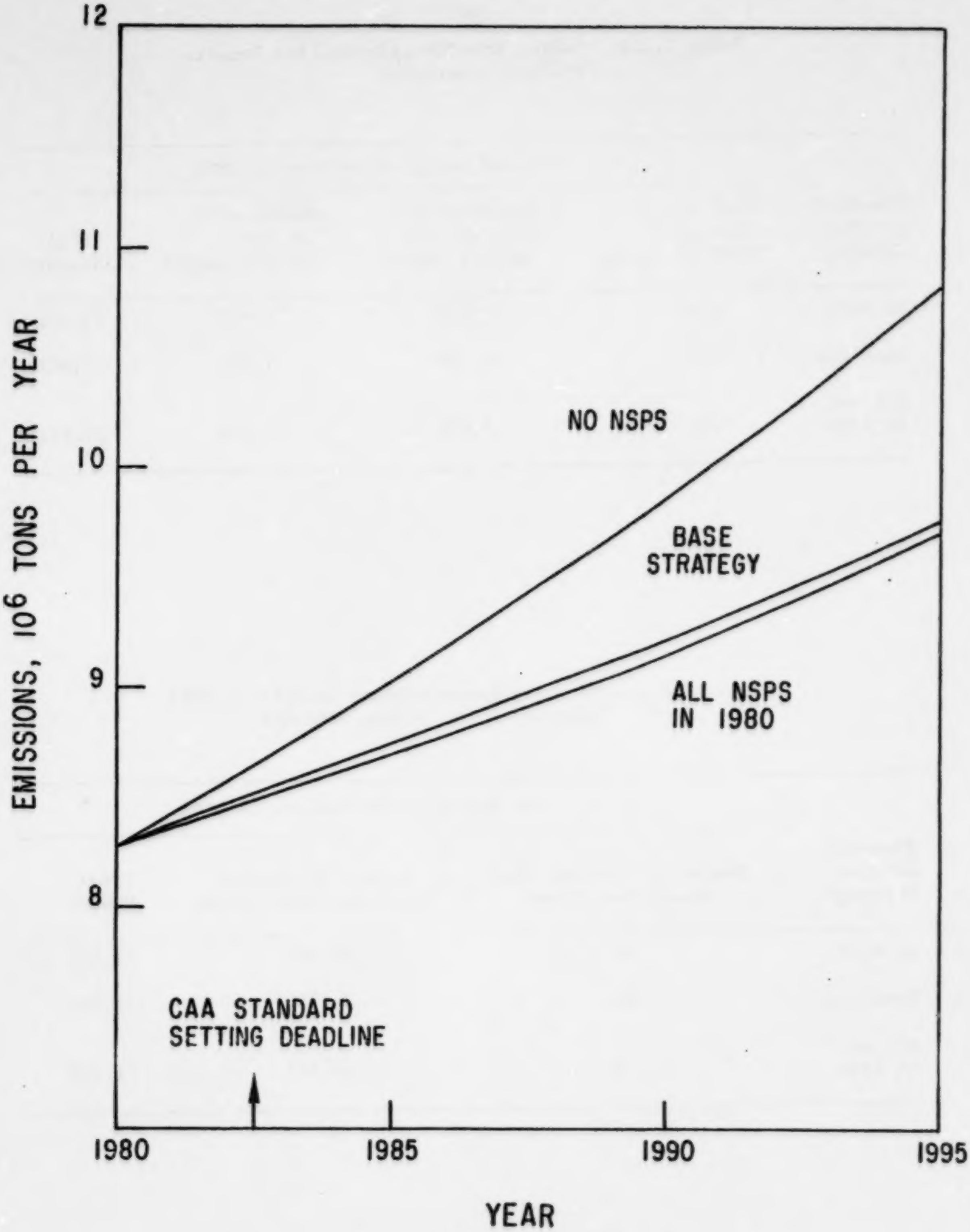

FIG. 3.2. NATIONWIDE SULFUR DIOXIDE EMISSIONS

Table 3.2.B. Sulfur Dioxides Air Quality Impacts of NSPS Strategies

Standard Setting Strategy	New and Modified Sources in 1990			
	Number with High Air Quality Impact	Number with Moderate Air Quality Impact	Number with Low Air Quality Impact	Total Number
No NSPS	639	8,220	2,962	11,821
Baseline	437	7,754	3,630	11,821
All set in 1980	436	7,656	3,729	11,821

Table 3.2.C. Mobility/Competiveness Impacts of NSPS Strategies for Sulfur Dioxides

Standard Setting Strategy	New and Modified Sources in 1990		
	Number of Sources that Could Have Moved	Number of Sources Precluded from Moving	Total Number
No NSPS	836	10,985	11,821
Baseline	62	11,759	11,821
All set in 1980	0	11,821	11,821

3.1.3 Nitrogen Dioxide

There were 32 major nitrogen dioxide emission source categories evaluated. This amounted to 20 percent of all categories evaluated. A major pollutant emission source is a source which has the potential of emitting a minimum of 100 tons per year of one or more specified pollutants without application of emission control techniques or processes.

The nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for both major and minor nitrogen dioxide emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state nitrogen dioxide emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide nitrogen dioxide emissions. The state emission factor limitation (Es) used was, in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Hypothetical average source sizes for each major nitrogen dioxide emission source category ranged from approximately 3600 tons product per year to over 700,000 tons product per year. Uncontrolled nitrogen dioxide emissions from an average hypothetical source size in each major nitrogen dioxide emission source category ranged from 800 pounds nitrogen dioxide per year to over 2,500 tons nitrogen dioxide per year.

During the 1980-1990 time period the new growth capacity was represented by the number of hypothetical new sources of average size. For the ten year period the number of new hypothetical sources for the nitrogen dioxide emission source categories ranged from as few as five sources per category to over 4000 sources per category.

The nationwide nitrogen dioxide emissions computed for 1980 as allowed by 1975 state emission factor limitations was over 6,000,000 tons nitrogen dioxide per year for the 32 major nitrogen dioxide emission source categories evaluated. Approximately 3 source categories accounted for 92 percent of these nitrogen dioxide emissions with 1 source category accounting for nearly 44 percent of the emissions.

The nationwide nitrogen dioxide source category production capacities were also computed for 1990. Nationwide nitrogen dioxide emissions for 1990 were computed assuming state emission limitation factors were in force during the 1980-1990 time period. Nationwide nitrogen dioxide emissions were also computed assuming application of an emission limitation reflecting a condition of best anticipated control (En), which would be applied to new or modified source construction during the same ten year period. The difference in the national emissions based on the state limitation and the more restrictive new and modified source limitation (Ts-Tn) in 1990 was then computed. The anticipated 1990 nitrogen dioxide emission reductions (Ts-Tn) by the application of (En) beginning in 1980 ranged from 50 tons per year to 1,270,000 tons per year. The (TS-Tn) values for major NO_2 source categories is listed in Table A-3, Appendix A.

The air quality impact of each of the 32 major nitrogen dioxide emission source categories was evaluated. A typical or average source size was selected for each source category for the dispersion analysis. The maximum ground level concentration (χ) was computed based both on the state emission factor limitation (Es) and the best level of anticipated control (En). The maximum ground level concentrations for both (Es) and (En) were compared after normalizing (dividing) by the appropriate ambient threshold value for nitrogen dioxide. These values were then ranked by order of magnitude and statistically divided into three groups, of High, Moderate and Low air quality impact.

Among the 32 major nitrogen dioxide emission source categories evaluated, 3 source categories or 9 percent had a High air quality impact resulting from the state emission limitation, (Es). For this High impact group, 2 or 67 percent of the nitrogen dioxide emission source categories were reduced to a Moderate or Low air quality impact by the application of the best anticipated emission limitation, (En). A total of 53 percent or 17 nitrogen dioxide emission source categories had a Low air quality impact based on state emission limitation factors.

Of the 32 major nitrogen dioxide emission source categories, 16 or 50 percent were considered to be non-mobile and non-competitive based on either market or raw material ties. Therefore, 16 nitrogen dioxide emission source categories or 50 percent of all the nitrogen dioxide emission source categories would be considered mobile and competitive and would tend to locate in states with less restrictive emission limitations, assuming all other mobility and competition considerations allowed the source the necessary flexibility in source siting.

Table 3.3.A gives the prioritized schedule for all nitrogen dioxide emission source categories under the Baseline Strategy. Assuming implementation of this schedule, nationwide emissions over time are shown in Fig. 3.3. For purposes of comparison emissions are also displayed for the following cases:

- All NSPS are set in 1980, that is, En becomes the applicable emission limitation for all sources in 1980. This case represents a lower bound to achievable emissions.
- No NSPS are set, that is, Es continues to be the applicable emission limitation for all sources. This case represents an upper bound for nationwide nitrogen dioxide emissions.

This figure shows that nationwide nitrogen dioxide emissions will continue to increase over time regardless of the standard setting rate and prioritization scheme. This insensitivity to the prioritization scheme is to be expected given the short time period in which the CAA requires NSPS to be set. Beyond mid-1982, both the Base Strategy and the lower bound are practically parallel because in both cases all new and replacement sources must meet the same limits. By 1990, the difference in emissions between the Base Strategy and the lower bound is small compared to the difference between the upper and lower bounds. That is, by 1990 the Base Strategy produces almost the same results in terms of emission reductions as setting all standards in 1980.

Very little difference in total emissions between the Base Strategy and the upper bound occur before 1981. This situation is probably due to a healthy growth in NO_2 emission sources. After 1981 NO_2 emissions under the Base Strategy closely parallel the all-NSPS case with little difference in emission levels. This is because the prioritized schedule places the emphasis on mass emission reduction.

Most of the high priority sources in this schedule are I.C. sources rather than process sources. The I.C. sources have the greatest potential for mass emission reductions.

Table 3.3.B compares the 1990 air quality impacts of the three NSPS schedules in terms of the number of new and modified sources having high, moderate, and low air quality impacts. Table 3.3.C compares the mobility and competitiveness impacts of the three schedules in terms of the number of new and modified sources that could have moved under each schedule, that is, the number that were mobile prior to being regulated by an NSPS. The number of new and modified sources that are either non-mobile initially or that become non-mobile when an NSPS is set is also given.

TABLE 3-3-A PRIORITIZED NSPS SCHEDULE FOR NO_2[a]

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0					
	1.00	EXPLOSIVE IND (HIGH FXPLOSIVES)	6.400000	20 C17	N5
	2.00	STATICNARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)	131.000000	10 C01	N4
	3.00	STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)	123.000000	10 C02	N4
	4.00	STATICNERY PIPELINE CCMPRESSCR ENGINES	15.129999	11 C01	N5
	5.00	INDUSTRIAL BOILERS (10-250X10E6 BTU/HR)	0.365000	10 A03	N5
	6.00	POLYETHYLENE (HIGH DENSITY)	11.250000	20 B03	N2
1980.5					
	1.00	INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)	0.650000	11 B04	N2
	2.00	MIXED FUEL BOILERS (COAL & REFUSE)	5.250000	10 A06	N4
	3.00	INDUSTRIAL INCINERATION (IND ORGANIC LIQUID WASTE INC)	0.150000	12 B04	N5
	4.00	EXPLOSIVE IND (LOW EXPLOSIVES)	2.099999	20 C18	N6
	5.00	GLASS MANUFACTURING INDUSTRY (SODA-LIME GLASS)	0.360000	40 D07	N6
	6.00	FIBERGLASS MFG. PLANTS (TEXTILE PROCESSING)	22.599991	40 D06	N1
1981.0					
	1.00	ADIPIC ACID PLANTS	1.610000	20 A04	N5
	2.00	FIBERGLASS MFG. PLANTS (WOOL PROCESSING)	1.570000	40 D14	N4
	3.00	POTASH	0.025000	20 A18	N5
	4.00	MIXED FUEL BOILERS (OIL & REFUSE)	13.799999	10 A07	N4
	5.00	BY-PRODUCT COKE OVEN	0.050000	50 A10	N4
	6.00	GLASS MANUFACTURING INDUSTRY (LEAD GLASS)	0.380000	40 D19	N6
1981.5					
	1.00	CERAMIC CLAY MFG	0.200000	40 D10	N6
	2.00	NITRATE FERTILIZER (AMMONIUM NITRATE) PLANTS	0.003000	30 A05	N6
	3.00	MINERAL WOOL MFG	0.080000	40 D13	N6
	4.00	STYRENE	0.004000	20 C45	N6
	5.00	ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE	0.010000	20 C35	N6
	6.00	STEEL FOUNDRIES (ELECTRIC APC)	0.200000	50 D01	N6
1982.0					
	1.00	STEEL FOUNDRIES (OPEN HEARTH)	0.010000	50 D02	N6
	2.00	MUNICIPAL INCINERATION < 50T/D	1.049999	10 B03	N6
	3.00	(AGG) PERIODIC KILNS(OIL), DRYERS AND STORAGE	1.700000	46 D11	N6
	4.00	(AGG) TUNNEL KILNS(OIL),DRYERS AND STORAGE	0.150000	45 D11	N6
	5.00	(AGG) TUNNEL KILNS(COAL),DRYERS AND STORAGE	0.900000	45 D12	N6
	6.00	(AGG) PERIODIC KILNS(COAL),DRYERS AND STORAGE	1.400000	46 D12	N6
1982.5					
	1.00	(AGG) PERIODIC KILNS(GAS),DRYERS AND STORAGE	0.420000	46 D10	N6
	2.00	(AGG) TUNNEL KILNS(GAS),DRYERS AND STORAGE	0.150000	45 D10	N6

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[a] See Table 3-1-B for Definition of Terms

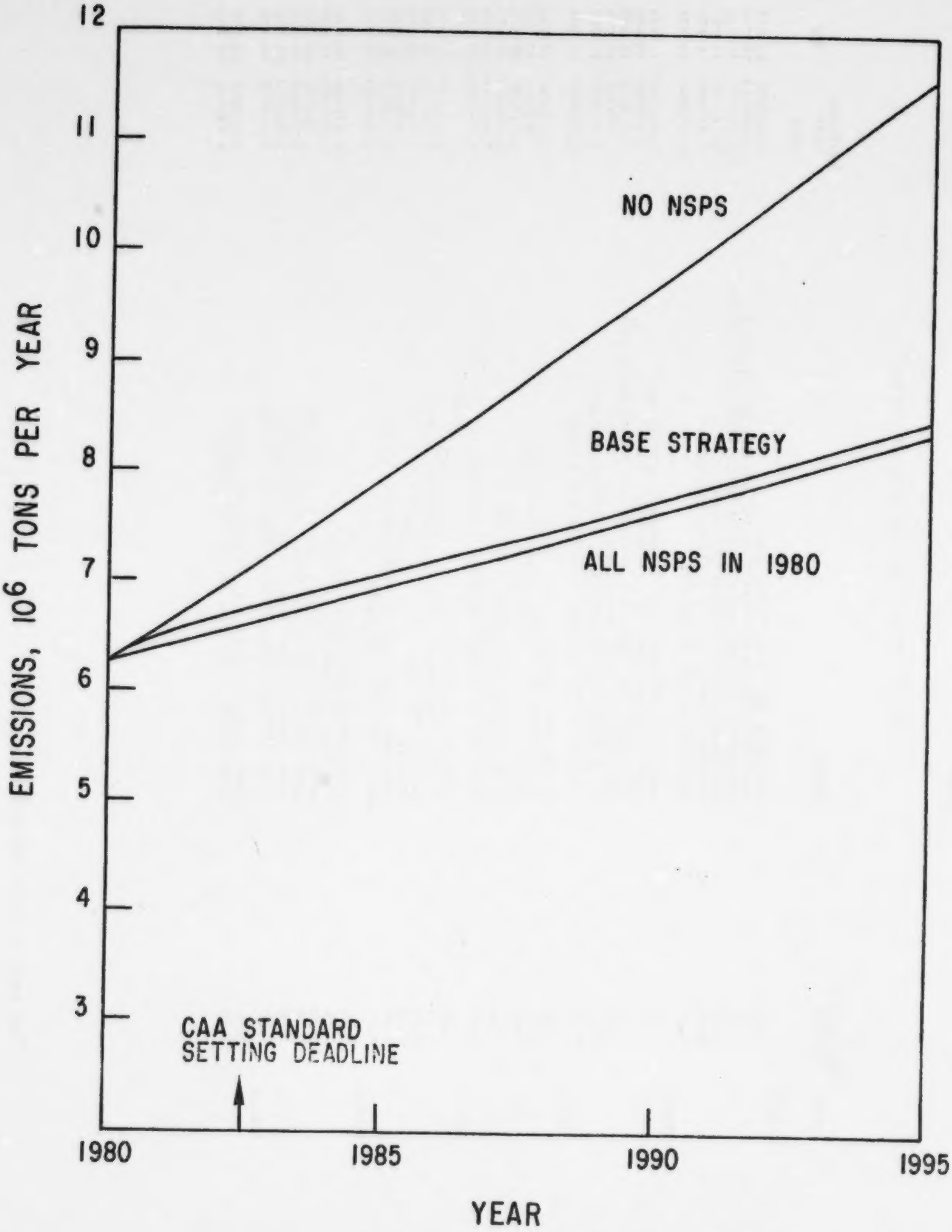

FIG. 3.3 NATIONWIDE NITROGEN DIOXIDE EMISSIONS

Table 3.3.B. Nitrogen Dioxide Air Quality Impacts of NSPS Strategies

	New and Modified Sources in 1990			
Standard Setting Strategy	Number with High Air Quality Impact	Number with Moderate Air Quality Impact	Number with Low Air Quality Impact	Total Number
No NSPS	121	10,175	5,019	15,315
Baseline	13	4,700	10,602	15,315
All set in 1980	12	4,694	10,609	15,315

Table 3.3.C. Mobility/Competiveness Impacts of NSPS Strategies for Nitrogen Dioxide

	New and Modified Sources in 1990		
Standard Setting Strategy	Number of Sources that Could Have Moved	Number of Sources Precluded from Moving	Total Number
No NSPS	3,843	11,472	15,315
Baseline	476	14,839	15,315
All set in 1980	0	15,315	15,315

3.1.4 Hydrocarbon

There were 93 major hydrocarbon emission source categories evaluated. This amounted to 59 percent of all categories evaluated. A major pollutant emission source is a source which has the potential of emitting a minimum of 100 tons per year of one or more specified pollutants without application of emission control techniques or processes.

The nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for both major and minor hydrocarbon emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state hydrocarbon emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide hydrocarbon emissions. The state emission factor limitation (Es) used was, in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Hypothetical average source sizes for each major hydrocarbon emission source category ranged from approximately 400 tons product per year to over 21 million barrels of oil per year for a refinery. Uncontrolled hydrocarbon emissions from an average hypothetical source size in each major hydrocarbon emission source category ranged from over 100 tons hydrocarbon per year to over 15,000 tons hydrocarbon per year.

During the 1980-1990 time period the new growth capacity was represented by the number of hypothetical new sources of average size. For the ten year period the number of new hypothetical sources for the major hydrocarbon emission source categories ranged from as few as one source per category to over 7,000 sources per category.

The nationwide hydrocarbon emissions computed for 1980 as allowed by 1975 state emission factor limitations was over 5.5 million tons hydrocarbon per year for the 93 major hydrocarbon emission source categories evaluated. Approximately 6 source categories accounted for 52 percent of these hydrocarbon emissions with 29 source categories accounting for nearly 90 percent of the emissions.

The nationwide hydrocarbon source category production capacities were also computed for 1990. Nationwide hydrocarbon emissions for 1990 were computed assuming state emission limitation factors were in force during the 1980-1990 time period. Nationwide hydrocarbon emissions were also computed assuming application of an emission limitation reflecting a condition of best anticipated control (E_n), which would be applied to new or modified source constuction during the same ten year period. The difference in the national emissions based on the state limitation and the more restrictive new and modified source limitation (Ts-Tn) in 1990 was then computed. The anticipated 1990 hydrocarbon emission reductions (Ts-Tn) by the application of (En) beginning in 1980 ranged from 50 tons per year to 817,000 tons per year. The (Ts-Tn) values for major hydrocarbon source categories is listed in Table A-3, Appendix A.

The air quality impact of each of the 93 major hydrocarbon emission source categories was evaluated. Actually 97 individual hydrocarbon emission source categories were evaluated for air quality impact. However, 4 source categories were actually unit operations of a larger representative source category and were aggregated for growth and mass emission purposes. The computer dispersion model program calculated the air quality impact for each of the unit operations and then computed a maximum air quality impact for the aggregated source category. A typical or average source size was selected for each source category for the dispersion analysis. The maximum ground level concentration (χ) was computed based both on the state emission factor limitation (Es) and the best level of anticipated control (En). The maximum ground level concentrations for both (Es) and (En) were compared after normalizing (dividing) by the appropriate ambient threshold value for hydrocarbons. These values were then ranked by order of magnitude and statistically divided into three groups of High, Moderate and Low air quality impact.

Among the 93 major hydrocarbon emission source categories evaluated, 54 source categories or 58 percent had a High air quality impact resulting from the state emission limitation, (Es). For this High impact group, 50 or 93 percent of the hydrocarbon emission source categories were reduced to a Moderate or Low air quality impact by the application of the best anticipated emission limitation, (En). A total of 11 percent or 10 hydrocarbon emission source categories had a Low air quality impact based on state emission limitation factors.

Of the 93 major hydrocarbon emission source categories, 32 or 34 percent were considered to be non-mobile and non-competitive based on either market or raw material ties. Therefore, 61 hydrocarbon emission source categories or 66 percent of the major hydrocarbon emission source categories would be considered mobile and competitive and would tend to locate in states with less restrictive emission limitations, assuming all other mobility and competition considerations allowed the source the necessary flexibility in source siting.

Table 3.4.A gives the prioritized schedule for all hydrocarbon emission source categories under the Baseline Strategy described above. Nationwide hydrocarbon emissions as a function of time assuming implementation of this schedule are shown in Figure 3.4. For purposes of comparison, the emissions are also displayed for the following limiting cases:

- All NSPS are set in 1980, that is, En becomes the applicable emission limitation for all hydrocarbon sources in 1980. This case represents a lower bound to achievable hydrocarbon emissions.
- No NSPS are set, that is, Es continues to be the applicable emission limitation for all sources. This case represents an upper limit for nationwide hydrocarbon emissions.

Examination of Fig. 3.4 shows that nationwide hydrocarbon emissions will continue to decrease with time by the application of En, regardless of the standard setting rate and prioritization scheme. This insensitivity to the prioritization scheme is to be expected given the short time frame in which the Clean Air Act requires standards to be set. Beyond mid-1982, both the Base Strategy and the lower bound case are almost parallel, because in both cases all new and replacement sources must meet the same emission limitations.

Figure 3.4 shows that as a result of the prioritization schedule the hydrocarbon emissions rise between 1980 and 1981 and then start to decline after 1981, paralleling the lower bound (En) emission case beginning in 1981. This initial rise in hydrocarbon emissions is due to a healthy growth in source categories and the initial lag of the impact of NSPS.

Table 3.4.B compares the 1990 air quality impacts of the three NSPS schedules in terms of the number of new and modified sources having high, moderate, and low air quality impacts. Table 3.4.C compares the mobility and competitiveness impacts of the three schedules in terms of the number of new and modified sources that could have moved under each schedule, that is, the number that were mobile prior to being regulated by an NSPS. The number of new and modified sources that are either non-mobile initially or that become non-mobile when an NSPS is set is also given.

TABLE 3-4-A PRIORITIZED NSPS SCHEDULE FOR HYDROCARBONS[a]

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0	1.00	ETHYLENE OXIDE PLANTS (AIR OXIDATION PROCESS)	1.679999	21 C11	M2
	2.00	ACRYLONITRILE PLANTS	7.919999	20 C06	M2
	3.00	DIMETHYL TEREPHTHALATE PLANTS	0.370000	20 C28	M2
	4.00	CARBON BLACK (FURNACE PROCESS)	0.100000	20 C03	M3
	5.00	INDUSTRIAL SURFACE COATING (CAN COATING)	0.050000	62 B03	M2
	6.00	(AGG) PETROLEUM REFINERY MISC. SOURCES	0.015000	71 D01	M1
	7.00	INDUSTRIAL SURFACE COATING (PAPER COATING)	0.260000	63 B03	M1
	8.00	DRY CLEANING	24.399994	60 B01	M2
	9.00	FUEL CONVERSION HIGH BTU COAL GASIFICATION	0.680000	21 C20	M2
	10.00	INDUSTRIAL SURFACE COATING (FABRIC COATING)	0.260000	64 B02	M2
	11.00	GRAPHIC ARTS INDUSTRY (GRAVURE)	65.000000	60 B04	M2
	12.00	BY-PRODUCT COKE OVEN	0.042000	50 A10	M2
	13.00	PLASTICS AND RESINS (ACRYLIC)	2.400000	20 B17	M5
	14.00	STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)	0.0	10 C01	M5
	15.00	STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)	0.0	10 C02	M5
	16.00	INDUSTRIAL SURFACE COATING (AUTOMOBILES)	0.310000	62 B02	M5
1980.5	1.00	BEER PROCESSING PLANTS	0.109000	30 D09	M2
	2.00	ETHYLENE DICHLORIDE PLANTS (OXYCHLORINATION PROCESS)	0.540000	20 C07	M2
	3.00	FORMALDEHYDE PLANTS	0.064000	20 C08	M3
	4.00	ACRYLIC ACID	1.740000	20 C47	M2
	5.00	VEGETABLE OIL MFG.	15.200000	30 D11	M2
	6.00	CYCLOHEXANOL/CYCLOHEXANONE	1.007000	20 C49	M2
	7.00	PROPYLENE (OXIDE)	0.592000	20 C36	M2
	8.00	METHYL METHACRYLATE PLANTS	1.127999	20 C34	M2
	9.00	VINYL ACETATE (ETHYLENE)	0.430000	20 C37	M2
	10.00	TEREPHTHALIC ACID PLANTS	0.210000	20 C27	M3
	11.00	ETHYLENE-PROPYLENE	0.720000	20 D06	M2
	12.00	ETHYLENE OXIDE PLANTS (OXYGEN OXIDATION PROCESS)	0.430000	22 C11	M2
	13.00	VARNISH	0.679000	20 C15	M2
	14.00	POLYETHYLENE (HIGH DENSITY)	0.591000	20 B03	M2
	15.00	METHANOL PLANTS	0.100000	20 C32	M2
	16.00	CHARCOAL PLANTS	4.799999	20 C16	M2
1981.0	1.00	CYCLOHEXANE	0.200000	20 A14	M2
	2.00	ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE	0.349000	20 C35	M2
	3.00	SYTHETIC RUBBER (NEOPRENE)	1.200000	20 D07	M2
	4.00	ADIPIC ACID PLANTS	0.043000	20 A04	M3
	5.00	CARBON TETRACHLORIDE (METHANE)	0.360000	20 C38	M2
	6.00	POLYETHYLENE (LOW DENSITY)	0.240000	20 B04	M2
	7.00	ACETIC ANHYDRIDE	0.178000	20 C48	M2
	8.00	ETHYL BENZENE	0.050000	20 C30	M2
	9.00	INDUSTRIAL SURFACE COATING (METAL COILS COATING)	0.320000	63 B02	M2
	10.00	P.T.M. ID. (SHIP & BARGE TRANSFER, GAS. & CRUDE OIL)	0.001300	60 P03	M1
	11.00	GRAPHIC ARTS INDUSTRY (FLEXOGRAPHY)	26.000000	60 B05	M2
	12.00	ETHYLENE	0.330000	20 C31	M4
	13.00	PRINTING INK PLANTS	4.799999	20 C19	M5
	14.00	SYNTHETIC FIBER INDUSTRY (NYLON)	0.350000	20 B09	M4
	15.00	INDUSTRIAL SURFACE COATING (LARGE APPLIANCE COATING)	0.065000	61 B02	M5
	16.00	GRAPHIC ARTS INDUSTRY (LETTERPRESS)	35.000000	60 B07	M4
1981.5	1.00	INDUSTRIAL SURFACE COATING (MAGNET WIRE COATING)	0.065000	61 B03	M5
	2.00	P.T.M. ID. (BULK GAS. TERMINALS) LOADING TANK TRUCKS/RR CAR	0.003600	60 P04	M4
	3.00	(AGG) CRUDE OIL AND NATURAL GAS PRODUCTION PLANTS	0.131000	71 E01	M6

[a] See Table 3-1-B for Definition of Terms

TABLE 3-4-A[a] (Cont'd)

YEAR	CUMULATIVE EFFECT	SOURCE	STANDARD USED (En)	CODE	FLAG
1981.5	4.00	MALEIC ANHYDRIDE	2.620000	20 C23	M2
	5.00	CARBON TETRACHLORIDE (PROPANE)	0.320000	20 C39	M2
	6.00	CARBON TETRACHORIDE (CARBON DISULFIDE)	0.320000	20 C40	M2
	7.00	PHENOL PLANTS	0.044800	20 C33	M2
	8.00	ACETONE (ISOPROPANOL)	0.130000	20 C42	M2
	9.00	METHYL CHLOROFORM	0.360000	20 C44	M3
	10.00	ACETONE (CUMENE)	0.072000	20 C41	M2
	11.00	POLY-BUTADIENE	0.090000	20 D02	M2
	12.00	PHENOLIC RESINS	0.075000	20 B10	M2
	13.00	ACETATE RAYON	0.350000	20 B13	M2
	14.00	UREA-MELAMINE	0.075000	20 B11	M2
	15.00	ALLYL CHLORIDE	0.200000	20 C46	M3
	16.00	ACETONE (CYANOHYDRIN)	0.020000	20 C43	M2
1982.0	1.00	ACETIC ACID (BUTANE)	0.147000	20 A13	M3
	2.00	INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)	2.879999	11 B04	M1
	3.00	AMMONIA PLANTS	0.0	21 C13	M5
	4.00	ACETIC ACID (ACETALDEHYDE)	0.196000	20 A11	M5
	5.00	PLYWOOD MANUFACTURING PLANT	0.0	80 B01	M4
	6.00	POLYSTYRENE	0.120000	20 B05	M5
	7.00	ABS-SAN RESIN PLANT	0.075000	20 B12	M5
	8.00	ACETIC ACID (METHANOL)	0.150000	20 A12	M5
	9.00	STYRENE	0.016400	20 C45	M5
	10.00	MINERAL WOOL MFG	0.869000	40 D13	M4
	11.00	WHISKEY	0.000055	30 D08	M5
	12.00	PHTHALIC ANHYDRIDE PLANTS (OXYLENE PROCESS)	0.020000	20 C26	M5
	13.00	FIBERGLASS MFG. PLANTS (WOOL PROCESSING)	2.099999	40 D14	M4
	14.00	POLYPROPLYENE	0.236000	20 B07	M4
	15.00	PHTHALIC ANHYDRIDE PLANTS (NAPTHALENE PROCESS)	0.100000	20 C25	M5
	16.00	TEXTILE MFG (HEAT SETTING/FINISHING)	4.740000	90 F02	M4
1982.5	1.00	SYNTHETIC RUBBER IND. (STYRENE-BUTADIENE) (SBR)	3.099999	20 D01	M4
	2.00	(AGG) ASPHALT ROOFING PLANTS	0.430000	41 B01	M4
	3.00	MIXED FUEL BOILERS (COAL & REFUSE)	0.0	10 A06	M5
	4.00	MIXED FUEL BOILERS (OIL & REFUSE)	0.285000	10 A07	M5
	5.00	INDUSTRIAL BOILERS (10-250X10E6 BTU/HR)	0.0	10 A03	M6
	6.00	INDUSTRIAL INCINERATION (IND ORGANIC LIQUID WASTE INC)	0.0	12 B04	M6
	7.00	MUNICIPAL INCINERATION < 50T/D	0.010000	10 B03	M6
	8.00	(AGG) TUNNEL KILNS(COAL),DRYERS AND STORAGE	0.0	45 D12	M6
	9.00	(AGG) TUNNEL KILNS(OIL),DRYERS AND STORAGE	0.0	45 D11	M6
	10.00	(AGG) TUNNEL KILNS(GAS),DRYERS AND STORAGE	0.0	45 D10	M6
	11.00	(AGG) PERIODIC KILNS(COAL),DRYERS AND STORAGE	0.0	46 D12	M6
	12.00	(AGG) PERIODIC KILNS(GAS),DRYERS AND STORAGE	0.0	46 D10	M6
	13.00	(AGG) PERIODIC KILNS(OIL), DRYERS AND STORAGE	0.0	46 D11	M6

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[a] See Table 3-1-B for Definition of Terms

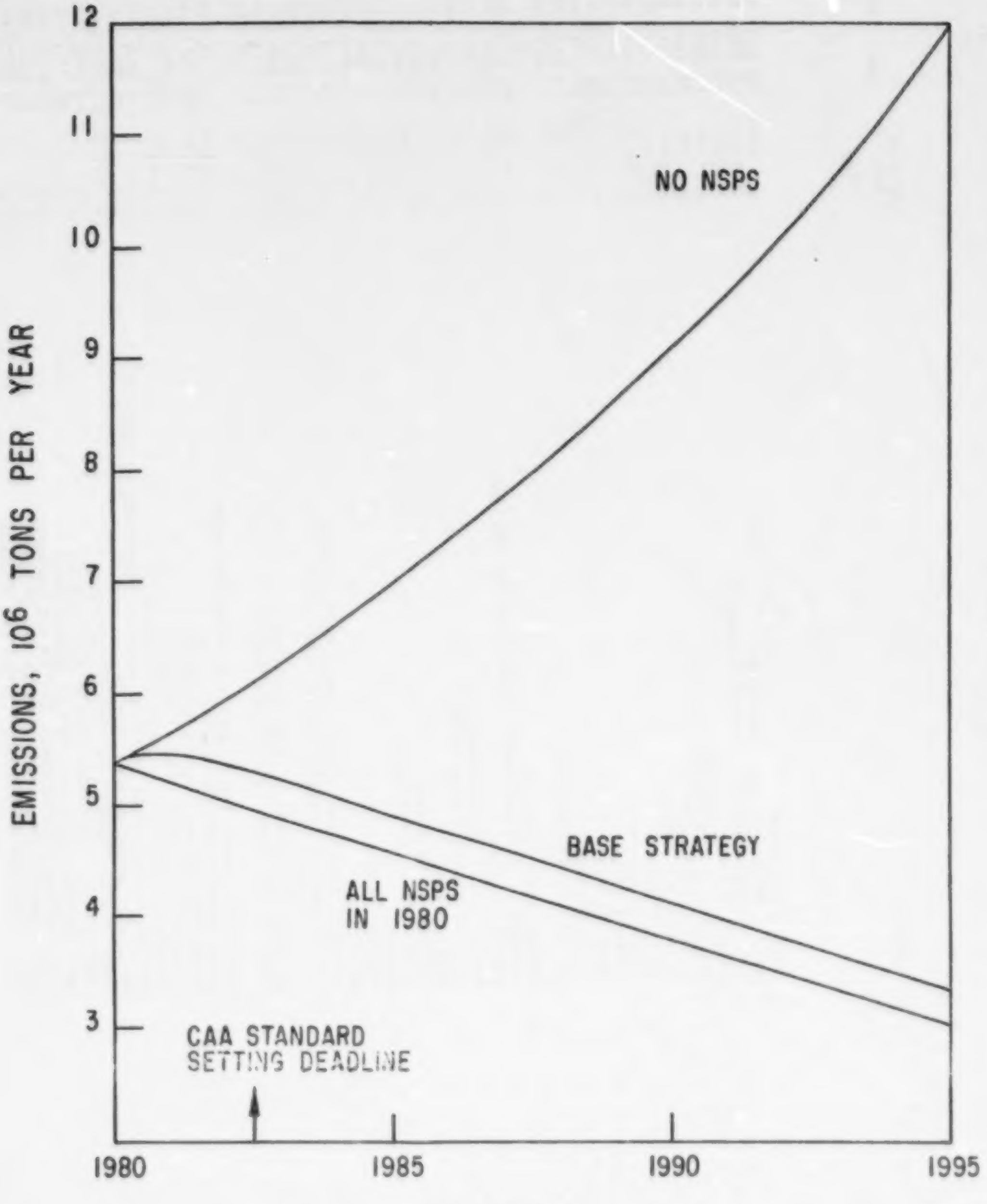

FIG. 3.4. NATIONWIDE HYDROCARBON EMISSIONS

Table 3.4.B. Hydrocarbon Air Quality Impacts of NSPS Strategies

Standard Setting Strategy	New and Modified Sources in 1990			
	Number with High Air Quality Impact	Number with Moderate Air Quality Impact	Number with Low Air Quality Impact	Total Number
No NSPS	9,733	5,315	6,016	21,064
Baseline	424	11,041	9,599	21,064
All set in 1980	355	10,905	9,804	21,064

Table 3.4.C. Mobility/Competiveness Impacts of NSPS Strategies for Hydrocarbon

Standard Setting Strategy	New and Modified Sources in 1990		
	Number of Sources that Could Have Moved	Number of Sources Precluded from Moving	Total Number
No NSPS	3,453	17,611	21,064
Baseline	266	20,798	21,064
All set in 1980	0	21,064	21,064

3.1.5 Carbon Monoxide Emissions

There were 36 major carbon monoxide emission source categories evaluated. This amounted to 23 percent of all major source categories evaluated. A major pollutant emission source is a source which has the potential of emitting a minimum of 100 tons per year of one or more specified pollutants without application of emission control techniques or processes.

The nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for both major and minor carbon monoxide emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state carbon monoxide emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide carbon monoxide emissions. The state emission factor limitation (Es) used was, in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Hypothetical average source sizes for each major carbon monoxide emission source category ranged from approximately 1800 tons product per year to over 700,000 tons product per year. Uncontrolled carbon monoxide emissions from an average hypothetical source size in each carbon monoxide emission source category ranged from over 100 tons carbon monoxide per year to over 72,000 tons carbon monoxide per year.

During the 1980-1990 time period the new growth capacity was represented by the number of hypothetical new sources of average size. For the ten year period the number of new hypothetical sources for the carbon monoxide emission source categories ranged from as few as one source per category to over 4,000 sources per category.

The nationwide carbon monoxide emissions computed for 1980 as allowed by a 1975 state emission factor limitation was over 6.5 million tons carbon monoxide per year for the 36 major carbon monoxide emission source categories evaluated. Approximately 8 source categories accounted for 89 percent of these carbon monoxide emissions with 2 source categories accounting for nearly 66 percent of the emissions.

The nationwide carbon monoxide source category production capacities were also computed for 1990. Nationwide carbon monoxide emissions for 1990 were computed assuming state emission limitation factors were in force during the 1980-1990 time period. Nationwide carbon monoxide emissions were also computed assuming application of an emission limitation reflecting a condition of best anticipated control (E_n), which would be applied to new or modified source construction during the same ten year period. The difference in the national emissions based on the state limitation and the more restrictive new and modified source limitation (Ts-Tn) in 1990 was then computed. The anticipated 1990 carbon monoxide emission reductions (Ts-Tn) by the application of (En) beginning in 1980 ranged from 20 tons per year to nearly 2 million tons per year.

The air quality impact of each of the 36 major carbon monoxide emission source categories was evaluated. A typical or average source size was selected for each source category for the dispersion analysis. The maximum ground level concentration (χ) was computed based both on the state emission factor limitation (Es) and the best level of anticipated control, (En). The maximum ground level concentrations for both (Es) and (En) were compared after normalizing (dividing) by the appropriate ambient threshold value for carbon monoxide. These values were then ranked by order of magnitude and statistically divided into three groups, of High, Moderate and Low air quality impact.

Among the 36 major carbon monoxide emission source categories evaluated, none of the categories had a High air quality impact resulting from the state emission limitation, (Es). A total of 53% or 19 carbon monoxide emission source categories had a Low air quality impact based on state emission limitation factors.

Of the 36 major carbon monoxide emission source categories, 15 or 42 percent were considered to be nonmobile and noncompetitive based on either market or raw material ties. Therefore, 21 carbon monoxide emission source categories or 58 percent of all the major carbon monoxide emission source categories would be considered mobile and competitive and would tend to locate in states with less restrictive emission limitations, assuming all other mobility and competition considerations allowed the source the necessary flexibility in source siting.

Table 3.5.A gives the prioritized schedule for all carbon monoxide emission source categories under the Baseline Strategy. Assuming implementation of this strategy, Fig. 3.5 shows nationwide emissions over time. The following two cases are also displayed for comparison purposes:

- All NSPS are set in 1980, that is, En becomes the applicable emission limit for all sources in 1980. This represents a lower limit to achievable emissions.
- No NSPS are set, that is, Es continues to be the applicable emission limit. This case represents an upper limit for nationwide carbon monoxide emissions.

The upward trend in stationary source emissions can be reversed under NSPS. Under the Base Strategy, emission reductions are substantial and occur early in the standard setting period. Beyond 1982, both the Base Strategy and the lower limit are almost parallel, as would be expected given the short time in which the CAA requires all NSPS to be set. Beyond mid-1982, all new and replacement sources must meet NSPS in both the base and lower limit cases. The difference in emissions between the Base Strategy and the lower limit is small compared to the difference between the upper and lower limits by 1990. By this time, the emission reductions under both the base and lower limit strategies are practically identical.

Process sources constitute most of the high priority sources; combustion sources occur nearer the bottom of the list. This occurs because the process sources generally have high mass emission reduction potential (Ts-Tn), tend to be mobile, and have higher air quality impacts than the combustion sources.

Table 3.5.B compares the 1990 air quality impacts of the three NSPS schedules in terms of the number of new and modified sources having high, moderate, and low air quality impacts. Table 3.5.C compares the mobility and competitiveness impacts of the three schedules in terms of the number of new and modified sources that could have moved under each schedule, that is, the number that were mobile prior to being regulated by an NSPS. The number of new and modified sources that are either non-mobile initially or that become non-mobile when an NSPS is set is also given.

TABLE 3-5-A PRIORITIZED NSPS SCHEDULE FOR CARBON MONOXIDE[a]

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0					
	1.00	CARBON BLACK (FURNACE PROCESS)	2.799999	20 C03	M5
	2.00	ACRYLONITRILE PLANTS	8.000000	20 C06	M5
	3.00	MINERAL WOOL MFG	4.719999	40 D13	M5
	4.00	PHTHALIC ANHYDRIDE PLANTS (OXYLENE PROCESS)	3.009999	20 C26	M5
	5.00	FORMALDEHYDE PLANTS	0.157000	20 C08	M5
	6.00	MALEIC ANHYDRIDE	15.599999	20 C23	M5
1980.5					
	1.00	STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)	0.0	10 C01	M6
	2.00	STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)	0.0	10 C02	M6
	3.00	INDUSTRIAL BOILERS (10-250X10E6 BTU/HR)	0.0	10 A03	M6
	4.00	CYCLOHEXANOL/CYCLOHEXANONE	1.115000	20 C49	M5
	5.00	ADIPIC ACID PLANTS	0.115000	20 A04	M5
	6.00	CYCLOHEXANE	0.250000	20 A14	M5
1981.0					
	1.00	METHANOL PLANTS	0.100000	20 C32	M5
	2.00	ACETIC ANHYDRIDE	0.219000	20 C48	M5
	3.00	CHARCOAL PLANTS	3.200000	20 C16	M5
	4.00	STATIONERY PIPELINE COMPRESSOR ENGINES	9.639999	11 C01	M6
	5.00	ACRYLIC ACID	0.240000	20 C47	M5
	6.00	PHTHALIC ANHYDRIDE PLANTS (NAPTHALENE PROCESS)	1.000000	20 C25	M5
1981.5					
	1.00	GREY IRON FOUNDRIES (CUPOLA)	8.000000	50 C04	M5
	2.00	INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)	8.469999	11 B04	M4
	3.00	BY-PRODUCT COKE OVEN	2.669999	50 A10	M4
	4.00	ETHYLENE DICHLORIDE PLANTS (OXYCHLORINATION PROCESS)	0.013000	20 C07	M6
	5.00	ACETIC ACID (ACETALDEHYDE)	0.040000	20 A11	M6
	6.00	PHENOL PLANTS	0.005000	20 C33	M6
1982.0					
	1.00	FIBERGLASS MFG. PLANTS (WOOL PROCESSING)	2.240000	40 D14	M6
	2.00	ACETIC ACID (BUTANE)	0.044000	20 A13	M6
	3.00	FIBERGLASS MFG. PLANTS (TEXTILE PROCESSING)	2.030000	40 D06	M6
	4.00	(AGG) ASPHALT ROOFING PLANTS	0.015000	41 B01	M6
	5.00	INDUSTRIAL INCINERATION (IND ORGANIC LIQUID WASTE INC)	0.0	12 B04	M6
	6.00	MIXED FUEL BOILERS (COAL & REFUSE)	18.000000	10 A06	M6
1982.5					
	1.00	MIXED FUEL BOILERS (OIL & REFUSE)	17.000000	10 A07	M6
	2.00	(AGG) TUNNEL KILNS(COAL),DRYERS AND STORAGE	1.900000	45 D12	M6
	3.00	(AGG) TUNNEL KILNS(GAS),DRYERS AND STORAGE	0.300000	45 D10	M6
	4.00	MUNICIPAL INCINERATION < 50T/D	35.000000	10 B03	M6
	5.00	(AGG) PERIODIC KILNS(COAL),DRYERS AND STORAGE	3.200000	46 D12	M6
	6.00	(AGG) PERIODIC KILNS(GAS),DRYERS AND STORAGE	0.110000	46 D10	M6

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[a] See Table 3-1-B for Definition of Terms

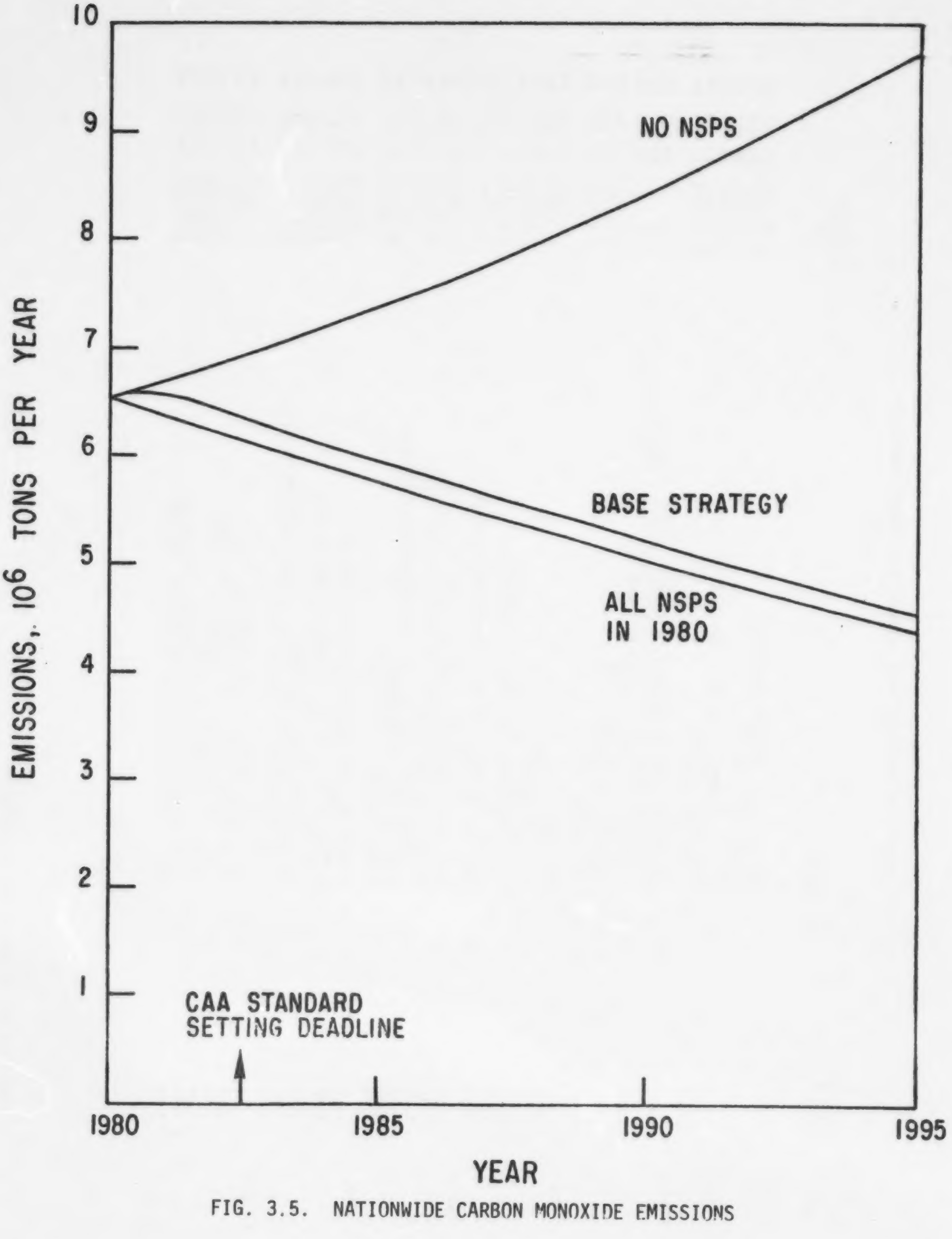

FIG. 3.5. NATIONWIDE CARBON MONOXIDE EMISSIONS

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Table 3.5.B. Carbon Monoxide Air Quality Impacts of NSPS Strategies

Standard Setting Strategy	New and Modified Sources in 1990			
	Number with High Air Quality Impact	Number with Moderate Air Quality Impact	Number with Low Air Quality Impact	Total Number
No NSPS	0	636	10,260	10,896
Baseline	0	94	10,802	10,896
All set in 1980	0	87	10,809	10,896

Table 3.5.C. Mobility/Competitiveness Impacts of NSPS Strategies for Carbon Monoxide

Standard Setting Strategy	New and Modified Sources in 1990		
	Number of Sources that Could Have Moved	Number of Sources Precluded from Moving	Total Number
No NSPS	649	10,247	10,896
Baseline	21	10,875	10,896
All set in 1980	0	10,896	10,896

3.1.6 Lead

There were 13 major lead emission source categories evaluated. This amounted to 8 percent of all major source categories evaluated. A major pollutant emission source is a source which has the potential of emitting a minimum of 100 tons per year of one or more specified pollutants without application of emission control techniques or processes.

The nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for both major and minor lead emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state lead emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide lead emissions. The state emission factor limitation (Es) used was, in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Hypothetical average source sizes for each major lead emission source category ranged from approximately 6,000 tons product per year to over 90,000 tons product per year. Uncontrolled lead emissions from an average hypothetical source size in each lead emission source category ranged from nearly 1 ton lead per year to over 1,900 tons lead per year.

During the 1980-1990 time period the new growth capacity was represented by the number of hypothetical new sources of average size. For the ten year period the number of new hypothetical sources for the lead emission source categories ranged from 14 sources per category to over 1,000 sources per category.

The nationwide lead emissions computed for 1980 as allowed by a 1975 state emission factor limitation was 12,800 tons lead per year for the 13 major lead emission source categories evaluated. Approximately 6 source categories accounted for 91 percent of these lead emissions with 2 source categories accounting for 59 percent of the emissions.

The nationwide lead source category production capacities were also computed for 1990. Nationwide lead emissions for 1990 were computed assuming state emission limitation factors were in force during the 1980-1990 time period. Nationwide lead emissions were also computed assuming application of an emission limitation reflecting a condition of best anticipated control (E_n), which would be applied to new or modified source construction during the same ten year period. The difference in the national emissions based on the state limitation and the more restrictive new and modified source limitation (Ts-Tn) in 1990 was then computed. The anticipated 1990 lead emission reductions (Ts-Tn) by the application of (En) beginning in 1980 ranged from 30 tons per year to 7,700 tons per year.

The air quality impact of each of the 13 major lead emission source categories was evaluated. A typical or average source size was selected for each source category for the dispersion analysis. The maximum ground level concentration (χ) was computed based both on the state emission factor limitation (Es) and the best level of anticipated control (En). The maximum ground level concentrations for both (Es) and (En) were compared after normalizing (dividing) by the appropriate ambient threshold value for lead. These values were then ranked by order of magnitude and statistically divided into three groups, of High, Moderate and Low air quality impact.

Among the 13 major lead emission source categories evaluated, 7 source categories or 24 percent had a High air quality impact resulting from the state emission limitation (Es). For this High impact group, 3 or 23 percent of the lead emission source categories were reduced to a Moderate or Low air quality impact by the application of the best anticipated emission limitation, (En). No lead emission source categories had a Low air quality impact based on state emission limitation factors.

Of the 13 major lead emission source categories, 5 or 39 percent were considered to be non-mobile and non-competitive based on either market or raw material ties. Therefore, 8 lead emission source categories or 61 percent of all the lead emission source categories would be considered mobile and competitive and would tend to locate in states with less restrictive emission limitations assuming all other mobility and competition considerations allowed the source the necessary flexibility in source siting.

Table 3-6.A gives the prioritization schedule for all lead emission source categories under the Baseline Strategy described above. Nationwide lead emissions as a function of time assuming implementation of this schedule are shown in Fig. 3.6. For purposes of comparison, the emissions are also displayed for the following limiting cases:

- All NSPS are set in 1980, that is, En becomes the applicable emission limitation for all lead sources in 1980. This case represents a lower bound to achievable lead emissions.
- No NSPS are set, that is, Es continues to be the applicable emission limitation for all sources. This case represents an upper limit for nationwide lead emissions.

Examination of Fig. 3.6 shows that nationwide lead emissions will continue to decline with time by the application of En regardless of the standard setting rate and prioritization scheme. This insensitivity to the prioritization scheme is to be expected given the short time frame in which the Clean Air Act requires standards to be set. Beyond mid-1982, both the Baseline Strategy and the lower bound case are almost parallel, because in both cases all new and replacement sources must meet the same emission limitations.

Figure 3.6 shows that as a result of the prioritization schedule the lead emissions rise between 1980 and 1981 and then decline gradually after 1981, paralleling the lower bound emission case. This initial rise in lead emissions is due to source growth and the lag of the impact of NSPS.

Further examination of Figure 3.6 shows that in 1984 the prioritization schedule provides a reduction of 2,000 tons per year lead from that allowed by state emission limitations. By 1987 this reduction in annual emissions has increased to 5,000 tons lead per year and by 1990 to 9,000 tons lead per year. After 1990 the prioritization scheme allows a constant differential increase in emission of 800 tons per year above that which would have been obtained if all lead En (NSPS) limitations were set in 1980.

Examination of Table 3.6.A indicates that standards are first set for Grey Iron Foundries (electric arc and reverbatory furnaces) and gasoline additive plants all of which have high potential mass emission reduction potential and also have high air quality impacts. Standards are set last for Metallic Mineral Mining because these plants have lower potential mass emission reduction, low air quality impact and are non-mobile.

Table 3-6-B gives the 1990 qir quality impact of each of the three prioritization cases in terms of the number of sources which continue to have high air quality impacts despite the setting of an NSPS. Table 3-6-C compares the mobility/competitiveness impacts of the three cases in terms of the number of sources that could have moved, that is, the number that were mobile prior to having had an NSPS set for them.

Table 3.6.B compares the 1990 air quality impacts of the three NSPS schedules in terms of the number of new and modified sources having high, moderate, and low air quality impacts. Table 3.6.C compares the mobility and competitiveness impacts of the three schedules in terms of the number of new and modified sources that could have moved under each schedule, that is, the number that were mobile prior to being regulated by an NSPS. The number of new and modified sources that are either non-mobile initially or that become non-mobile when an NSPS is set is also given.

TABLE 3-6-A PRIORITIZED NSPS SCHEDULE FOR LEAD[a]

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0	1.00	GREY IRON FOUNDRIES (ELECTRIC ARC)	0.0	50 C02	N3
	2.00	GREY IRON FOUNDRIES (REVERBERATORY)	0.0	50 C03	N3
	3.00	GASOLINE ADDITIVES (ELECTROLYTIC)	1.000000	70 F02	N1
1980.5	1.00	GASOLINE ADDITIVES (SODIUM-LEAD)	0.890000	70 F01	N1
	2.00	GREY IRON FOUNDRIES (CUPOLA)	0.030000	50 C04	N2
	3.00	INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)	0.040000	11 B04	N2
1981.0	1.00	METALIC MINERALS MINING (FERROALLOY)	0.003000	42 E01	N2
	2.00	GLASS MANUFACTURING INDUSTRY (LEAD GLASS)	0.060000	40 D19	N5
	3.00	(AGG) SECONDARY ZINC SMELTERS (RETORT REDUCTION & KETTLE FURNACES	0.050000	51 E01	N4
1981.5	1.00	(AGG) SECONDARY ZINC SMELTERS (HORIZ & REVERB FURNACES)	0.050000	51 E02	N4
	2.00	MUNICIPAL INCINERATION < 50T/D	0.0	10 B03	N4
	3.00	METALIC MINERALS MINING (LEAD MINING)	0.010000	44 E01	N4
1982.0	1.00	METALIC MINERALS MINING (ZINC MINE & CRUSHING)	0.010000	45 E01	N4

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[a] See Table 3-1-B for Definition of Terms

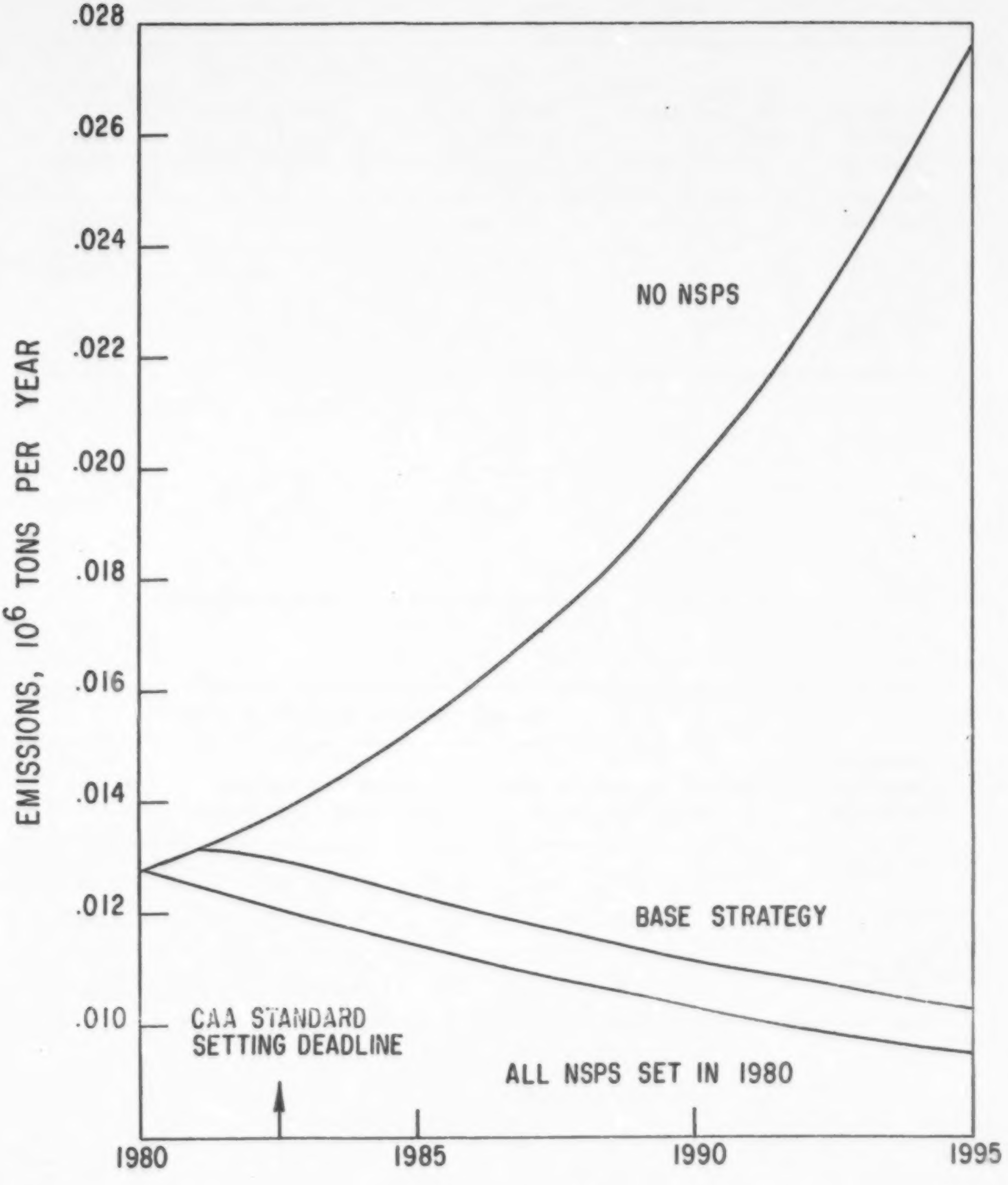

FIG. 3.6. NATIONWIDE LEAD EMISSIONS

Table 3.6.B. Lead Air Quality Impacts
of NSPS Strategies

Standard Setting Strategy	New and Modified Sources in 1990			
	Number with High Air Quality Impact	Number with Moderate Air Quality Impact	Number with Low Air Quality Impact	Total Number
No NSPS	229	838	0	1,067
Baseline	6	863	198	1,067
All set in 1980	0	861	206	1,067

Table 3.6.C. Mobility/Competiveness Impacts of NSPS
Strategies for Lead

Standard Setting Strategy	New and Modified Sources in 1990		
	Number of Sources that Could Have Moved	Number of Sources Precluded from Moving	Total Number
No NSPS	242	825	1,067
Baseline	12	1,055	1,067
All set in 1980	0	1,067	1,067

3.1.7 Fluoride

There were 18 major fluoride emission source categories evaluated. This amounted to 12 percent of all categories evaluated. A major pollutant emission source is a source which has the potential of emitting a minimum of 100 tons per year of one or more specified pollutants without application of emission control techniques or processes.

The nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for both major and minor fluoride emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state fluoride emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide fluoride emissions. The state emission factor limitation (Es) used was, in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Hypothetical average source sizes for each major fluoride emission source category ranged from approximately 3,000 tons product per year to almost 600,000 tons product per year. Uncontrolled fluoride emissions from an average hypothetical source size in each fluoride emission source category ranged from one ton fluoride per year to nearly 5,000 tons fluoride per year.

During the 1980-1990 time period the new growth capacity was represented by the number of hypothetical new sources of average size. For the ten year period the number of new hypothetical sources for the major fluoride emission source categories ranged from as few as two sources per category to over 4,000 sources per category.

The nationwide fluoride emissions computed for 1980 as allowed by a 1975 state emission factor limitation was 60,270 tons fluoride per year for the 18 major fluoride emission source categories evaluated. Approximately 7 source categories accounted for 91 percent of these fluoride emissions with 2 source categories accounting for 49 percent of the emissions.

The nationwide fluoride source category production capacities were also computed for 1990. Nationwide fluoride emissions for 1990 were computed assuming the state emission limitation factors were in force during the 1980-1990 time period. Nationwide fluoride emissions were also computed assuming application of an emission limitation reflecting a condition of best anticipated control (E_n), which would be applied to new or modified source construction during the same ten-year period. The difference in the national emissions based on the state limitation and the more restrictive new and modified source limitation (Ts-Tn) in 1990 was then computed. The anticipated 1990 fluoride emission reductions (Ts-Tn) by the application of (En) beginning in 1980 ranged from 4 tons per year to 16,400 tons per year.

The air quality impact of each of the 18 major fluoride emission source categories was evaluated. A typical or average source size was selected for each source category for the dispersion analysis. The maximum ground level concentration (χ) was computed based both on the state emission factor limitation (Es) and the best level of anticipated control (En). The maximum ground level concentrations for both (Es) and (En) were compared after normalizing (dividing) by the appropriate ambient threshold value for fluorides. These values were then ranked by order of magnitude and statistically divided into three groups, of High, Moderate and Low air quality impact.

Among the 18 major fluoride emission source categories evaluated, 17 source categories or 94 percent had a High air quality impact resulting from the state emission limitation, (Es). For this High impact group, 8 or 47 percent of the fluoride emission source categories were reduced to a Moderate or Low air quality impact by the application of the best anticipated emission limitation, (En). No major fluoride emission source category had a Low air quality impact based on state emission limitation factors.

Of the 18 major fluoride emission source categories, 9 or 50 percent were considered to be nonmobile and noncompetitive based on either market or raw material ties. Therefore, 9 fluoride emission source categories or 50 percent of all the fluoride emission source categories would be considered mobile and competitive and would tend to locate in states with less restrictive emission limitations, assuming all other mobility and competition considerations allowed the source the necessary flexibility in source siting.

Table 3.7.A gives the prioritization schedule for all fluoride emission source categories under the Baseline Strategy described above. Nationwide fluoride emissions as a function of time assuming implementation of this schedule are shown in Fig. 3.7. For purposes of comparison, the emissions are also displayed for the following limiting cases:

- All NSPS are set in 1980, that is, En becomes the applicable emission limitations for all fluoride sources in 1980. This case represents a lower bound to achievable fluoride emissions.
- No NSPS are set, that is, Es continues to be the applicable emission limitation for all sources. This case represents an upper limit for nationwide fluoride emissions.

Examination of Fig. 3.7 shows that nationwide fluoride emissions will continue to decrease with time by the application of En regardless of the standard setting rate and prioritization scheme. This insensitivity to the prioritization scheme is to be expected given the short time frame in which the Clean Air Act requires standards to be set. Beyond mid-1982, both the Base Strategy and the lower bound case are almost parallel, because in both cases all new and replacement sources must meet the same emission limitations.

Table 3.7.B compares the 1990 air quality impacts of the three NSPS schedules in terms of the number of new and modified sources having high, moderate, and low air quality impacts. Table 3.7.C compares the mobility and competitiveness impacts of the three schedules in terms of the number of new and modified sources that could have moved under each schedule, that is, the number that were mobile prior to being regulated by an NSPS. The number of new and modified sources that are either non-mobile initially or that become non-mobile when an NSPS is set is also given.

TABLE 3-7-A PRIORITIZED NSPS SCHEDULE FOR FLUORIDES[a]

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0					
	1.00	HYDROFLUORIC ACID PLANTS	0.200000	20 A08	N2
	2.00	CERAMIC CLAY MFG	0.300000	40 D10	N2
	3.00	PHOSPHORIC ACID PLANTS (WET PROCESS)	0.005000	20 A07	N2
1980.5					
	1.00	(AGG) CASTABLE REFRACTORY PLANTS	0.130000	40 D08	N1
	2.00	(AGG) SECONDARY COPPER PLANTS (BLAST FURNACE)	0.078000	57 B01	N2
	3.00	FIBERGLASS MFG. PLANTS (WOOL PROCESSING)	0.002000	40 D14	N2
1981.0					
	1.00	(AGG) SECONDARY ZINC SMELTERS (HORIZ & REVERB FURNACES)	0.023100	51 E02	N2
	2.00	(AGG) SECONDARY ZINC SMELTERS (RETORT REDUCTION & KETTLE FURNACES	0.077000	51 E01	N2
	3.00	FIBERGLASS MFG. PLANTS (TEXTILE PROCESSING)	2.000000	40 D06	N1
1981.5					
	1.00	(AGG) TUNNEL KILNS(GAS),DRYERS AND STORAGE	0.300000	45 D10	N1
	2.00	ANIMAL FEED DEFLUORINATION	0.438000	30 D10	N1
	3.00	(AGG) NON-METALLIC MINING - FLUORSPAR	0.100000	47 F01	N2
1982.0					
	1.00	(AGG) PERIODIC KILNS(GAS),DRYERS AND STORAGE	0.300000	46 D10	N1
	2.00	(AGG) TUNNEL KILNS(OIL),DRYERS AND STORAGE	0.300000	45 D11	N1
	3.00	(AGG) TUNNEL KILNS(COAL),DRYERS AND STORAGE	0.300000	45 D12	N1
1982.5					
	1.00	(AGG) PERIODIC KILNS(OIL), DRYERS AND STORAGE	0.300000	46 D11	N1.
	2.00	(AGG) PERIODIC KILNS(COAL),DRYERS AND STORAGE	0.300000	46 D12	N1.
	3.00	INDUSTRIAL BOILERS (10-250X10E6 BTU/HR)	0.000500	10 A03	N5

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[a] See Table 3-1-B for Definition of Terms

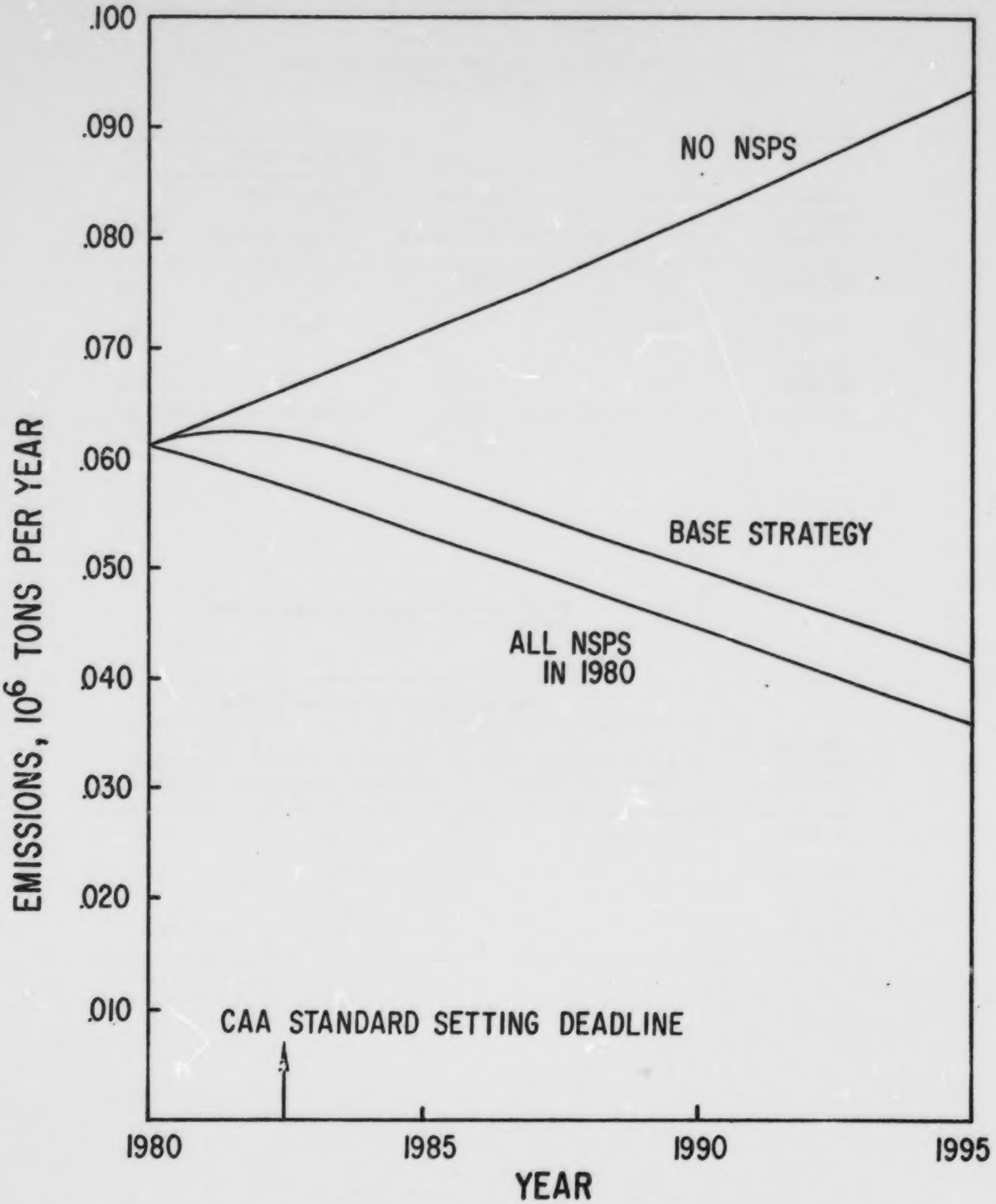

FIG. 3.7. NATIONWIDE FLUORIDE EMISSIONS

Table 3.7.B. Fluorides Air Quality Impacts of NSPS Strategies

Standard Setting Strategy	New and Modified Sources in 1990			
	Number with High Air Quality Impact	Number with Moderate Air Quality Impact	Number with Low Air Quality Impact	Total Number
No NSPS	3652	4016	0	7668
Baseline	968	3624	3076	7668
All set in 1980	958	2694	4016	7668

Table 3.7.C. Mobility/Competiveness Impacts of NSPS Strategies for Fluorides

Standard Setting Strategy	New and Modified Sources in 1990		
	Number of Sources that Could Have Moved	Number of Sources Precluded from Moving	Total Number
No NSPS	2793	4875	7668
Baseline	12	7656	7668
All set in 1980	0	7668	7668

3.1.8 Hydrogen Sulfide

There were 2 major hydrogen sulfide emission source categories evaluated. This amounted to 1 percent of all categories evaluated. A major pollutant emission source is a source which has the potential of emitting a minimum of 100 tons per year of one or more specified pollutants without application of emission control techniques or processes.

The nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for both major and minor hydrogen sulfide emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state hydrogen sulfide emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide hydrogen sulfide emissions. The state emission factor limitation (Es) used was in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Hypothetical average source size for each major hydrogen sulfide emission source category was approximately 62,000 tons product per year. Uncontrolled hydrogen sulfide emissions from an average hypothetical source size in each hydrogen sulfide emission source category ranged from 260 tons hydrogen sulfide per year to over 1,500 tons hydrogen sulfide per year.

During the 1980-1990 time period the new growth capacity was represented by the number of hypothetical new sources of average size. For the ten year period the number of new hypothetical sources for the hydrogen sulfide emission source categories ranged from as few as three sources per category to over 20 sources per category.

The nationwide hydrogen sulfide emissions computed for 1980 as allowed by a 1975 state emission factor limitation was 60,000 tons hydrogen sulfide per year for the 2 hydrogen sulfide emission source categories evaluated. One source category accounted for 96 percent of these hydrogen sulfide emissions.

The nationwide hydrogen sulfide source category production capacities were also computed for 1990. Nationwide hydrogen sulfide emissions for 1990 were computed assuming state emission limitation factors were in force during the 1980-1990 time period. Nationwide particulate emissions were also computed assuming application of an emission limitation reflecting a condition of best anticipated control (E_n), which would be applied to new or modified source constuction during the same ten year period. The difference in the national emissions based on the state limitation and the more restrictive new and modified source limitation (Ts-Tn) in 1990 was then computed. The anticipated 1990 hydrogen sulfide emission reductions (Ts-Tn) by the application of (En) beginning in 1980 ranged from 1 ton per year to 42,300 tons per year.

The air quality impact of each of the 2 major hydrogen sulfide emission source categories was evaluated. A typical or average source size was selected for each source category for the dispersion analysis. The maximum ground level concentration (χ) was computed based both on the state emission factor limitation (Es) and the best level of anticipated control (En). The maximum ground level concentrations for both (Es) and (En) were compared after normalizing (dividing) by the appropriate ambient threshold value for hydrogen sulfide. These values were then ranked by order of magnitude and statistically divided into three groups, of High, Moderate and Low air quality impact.

Among the 2 major hydrogen sulfide emission source categories evaluated, one source category had a High air quality impact resulting from the state emission limitation, (Es). For this High impact group, one hydrogen sulfide emission source category was reduced to a Moderate air quality impact by the application of the best anticipated emission limitation, (En).

Of the 2 hydrogen sulfide emission source categories, both were considered to be mobile and competitive based on either market or raw material ties. Therefore, the two source categories would be considered mobile and competitive and would tend to locate in states with less restrictive emission limitations, assuming all other mobility and competition considerations allowed the source the necessary flexibility in source siting.

Table 3.8.A gives the schedule for all emission categories that are sources of hydrogen sulfide prioritized under the Base Strategy. Nationwide emissions over time are shown in Fig. 3.8 assuming implementation of this schedule. For purposes of comparison, emissions are also displayed for these cases:

- All NSPS are set in 1980, that is, En becomes the applicable emission limit for all sources in 1980. This case represents a lower bound on achievable emissions.
- No NSPS are set, that is, Es continues to be the applicable emission limitation for all sources. This case represents an upper bound on nationwide emissions of hydrogen sulfide.

Since there are only two hydrogen sulfide source categories and one standard is set each time period through mid-1981, differences between the emission projections must be viewed with some caution. The figure shows, however, that nationwide hydrogen sulfide emissions will decrease over time. After mid-1981, both the Base Strategy and the lower bound are parallel. All NSPS have been set and in both cases new and replacement sources must meet the same limits. By 1990, the difference in emissions between the Base Strategy and the lower bound is small compared to the difference between the upper and lower bounds. By this time, both the base and lower bound strategies produce almost the same results in terms of emission reductions. Until 1981 there is little difference between the Base Strategy and the upper bound.

Table 3.8.B compares the 1990 air quality impacts of the three NSPS schedules in terms of the number of new and modified sources having high, moderate, and low air quality impacts. Table 3.8.C compares the mobility and competitiveness impacts of the three schedules in terms of the number of new and modified sources that could have moved under each schedule, that is, the number that were mobile prior to being regulated by an NSPS. The number of new and modified sources that are either non-mobile initially or that become non-mobile when an NSPS is set is also given.

TABLE 3-8-A PRIORITIZED NSPS SCHEDULE FOR HYDROGEN SULFIDE[a]

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0					
	1.00	CARBON BLACK (FURNACE PROCESS)	0.060000	20 C03	N5
1980.5					
	1.00	SYNTHETIC FIBERS INDUSTRY (VISCOSE RAYON)	1.599999	20 B06	N2

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[a] See Table 3-1-B for Definition of Terms

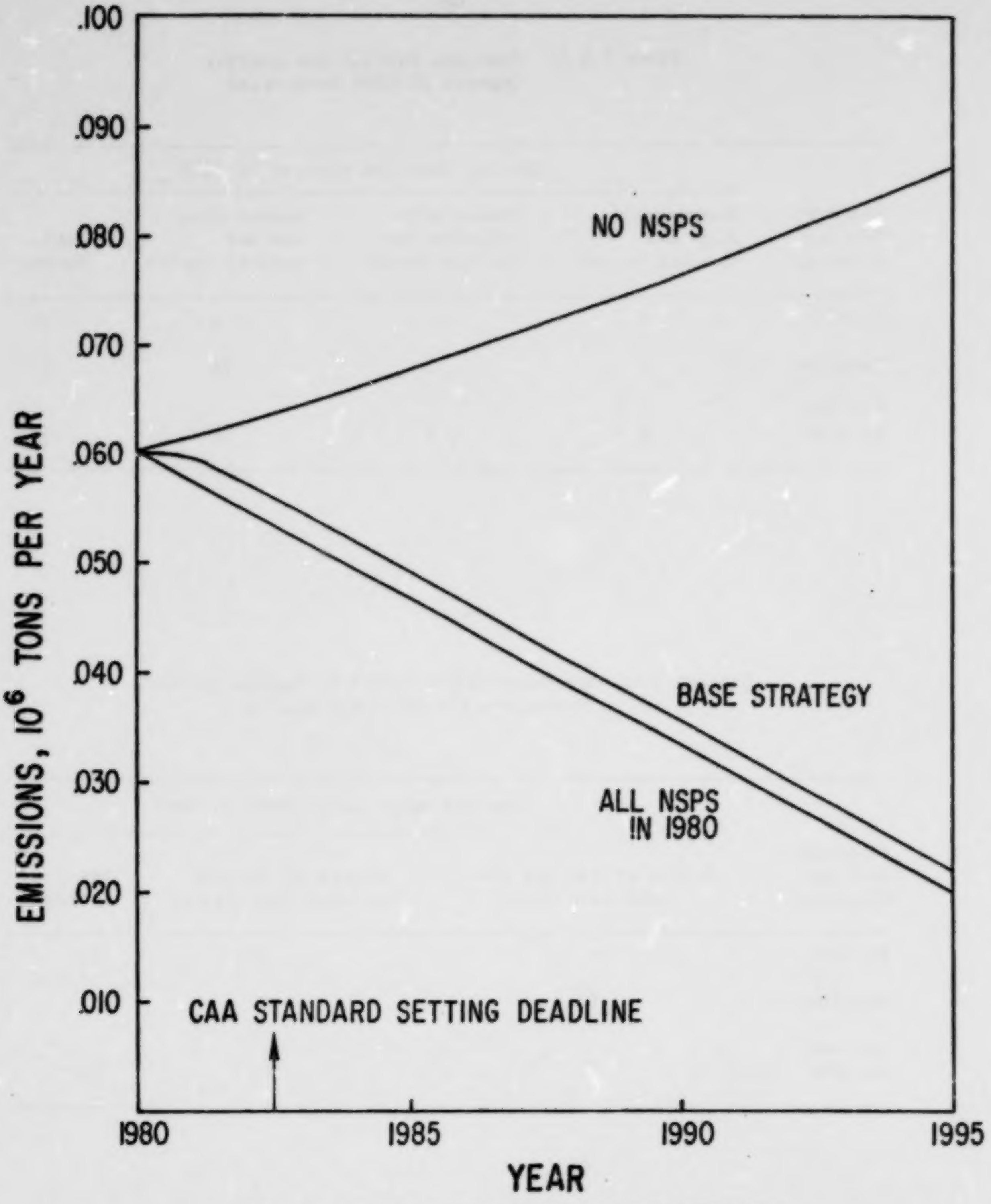

FIG. 3.8. NATIONWIDE HYDROGEN SULFIDE EMISSIONS

Table 3.8.B. Hydrogen Sulfide Air Quality Impacts of NSPS Strategies

	New and Modified Sources in 1990			
Standard Setting Strategy	Number with High Air Quality Impact	Number with Moderate Air Quality Impact	Number with Low Air Quality Impact	Total Number
No NSPS	3	24	0	27
Baseline	0	3	24	27
All set in 1980	0	3	24	27

Table 3.8.C. Mobility/Competitiveness Impacts of NSPS Strategies for Hydrogen Sulfide

	New and Modified Sources in 1990		
Standard Setting Strategy	Number of Sources that Could Have Moved	Number of Sources Precluded from Moving	Total Number
No NSPS	27	0	27
Baseline	0	27	27
All set in 1980	0	27	27

3.1.9 Sulfuric Acid Mist

There were 3 major Sulfuric acid mist emission source categories evaluated. This amounted to 2 percent of all categories evaluated. A major pollutant emission source is a source which has the potential of emitting a minimum of 100 tons per year of one or more specified pollutants without application of emission control techniques or processes.

The nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for both major and minor sulfuric acid mist emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state sulfuric acid mist emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide sulfuric acid mist emissions. The state emission factor limitation (Es) used was, in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Hypothetical average source sizes for each major sulfuric acid mist emission source category ranged from approximately 10,000 tons product per year to 120,000 tons product per year. Uncontrolled sulfuric acid mist emissions from an average hypothetical source size in each sulfuric acid mist emission source category ranged from 1.3 tons sulfuric acid mist per year to over 1,200 tons sulfuric acid mist per year.

During the 1980-1990 time period the new growth capacity was represented by the number of hypothetical new sources of average size. For the ten year period the number of new hypothetical sources for the sulfuric acid mist emission source categories ranged from approximately 30 sources per category to as many as 290 sources per category.

The nationwide sulfuric acid mist emissions computed for 1980 as allowed by a 1975 state emission factor limitation was 24,000 tons sulfuric acid mist per year for the 3 major sulfuric acid mist emission source categories evaluated. One source category accounted for 98 percent of the sulfuric acid mist emissions.

The nationwide sulfuric acid mist source category production capacities were also computed for 1990. Nationwide sulfuric acid mist emissions for 1990 were computed assuming state emission limitation factors were in force during the 1980-1990 time period. Nationwide sulfuric acid mist emissions were also computed assuming application of an emission limitation reflecting a condition of best anticipated control (E_n), which would be applied to new or modified source construction during the same ten year period. The difference in the national emissions based on the state limitation and the more restrictive new and modified source limitation (Ts-Tn) in 1990 was then computed. The anticipated 1990 sulfuric acid mist emission reductions (Ts-Tn) by the application of (En) beginning in 1980 ranged from 190 tons per year to 42,000 tons per year.

The air quality impact of each of the 3 sulfuric acid mist emission source categories was evaluated. A typical or average source size was selected for each source category for the dispersion analysis. The maximum ground level concentration (χ) was computed based both on the state emission factor limitation (Es) and the best level of anticipated control (En). The maximum ground level concentrations for both (Es) and (En) were compared after normalizing (dividing) by the appropriate ambient threshold value for sulfuric acid mist. These values were then ranked by order of magnitude and statistically divided into three groups, of High, Moderate and Low air quality impact.

Among the 3 major sulfuric acid mist emission source categories evaluted, one source category or 33 percent had a High air quality impact resulting from the state emission limitation, (Es). This High impact source category was not reduced to a Moderate or Low air quality impact by the application of the best anticipated emission limitation, (En). No sulfuric acid mist emission source categories had a Low air quality impact based on state emission limitation factors.

Of the 3 major sulfuric acid mist emission source categories, one was considered to be nonmobile and noncompetitive based on either market or raw material ties. Therefore, the two remaining sulfuric acid mist emission source categories would be considered mobile and competitive and would tend to locate in states with less restrictive emission limitations, assuming all other mobility and competition considerations allowed the source the necessary flexibility in source siting.

Table 3.9.A gives the prioritized schedule for all sulfuric acid mist emission source categories under the Baseline Strategy described above. Nationwide sulfuric acid mist emissions as a function of time assuming implementation of this schedule are shown in Figure 3.9. For purposes of comparison, the emissions are also displayed for the following limiting cases:

- All NSPS are set in 1980, that is, En becomes the applicable emission limitation for all sulfuric acid mist sources in 1980. This case represents a lower bound to achievable acid mist emissions.
- No NSPS are set, that is, Es continues to be the applicable emission limitation for all sources. This case represents an upper limit for nationwide sulfuric acid mist emissions.

Examination of Fig. 3.9 shows that nationwide sulfuric acid mist emissions will continue to decrease with time by the application of En regardless of the standard setting rate and prioritization scheme. This insensitivity to the prioritization scheme is to be expected given the short time frame in which the Clean Air Act requires standards to be set. Beyond mid-1982, both the Base Strategy and the lower bound case are almost parallel, because in both cases all new and replacement sources must meet the same emission limitations.

Figure 3.9 shows that as a result of the prioritization schedule the sulfuric acid mist emissions rise between 1980 and 1982 and then start to decline after 1982, paralleling the lower bound case. This graph should be viewed with caution since there are only three sulfuric acid mist source categories and one standard is set each time period through 1981.

Examination of Table 3.9.A indicates that standards are set for the Explosive Manufacturing Industry before Mixed Fuel Boilers because the former have higher mass emission reduction potential (Ts-Tn).

Table 3.9.B compares the 1990 air quality impacts of the three NSPS schedules in terms of the number of new and modified sources having high, moderate, and low air quality impacts. Table 3.9.C compares the mobility and competitiveness impacts of the three schedules in terms of the number of new and modified sources that could have moved under each schedule, that is, the number that were mobile prior to being regulated by an NSPS. The number of new and modified sources that are either nonmobile initially or that become nonmobile when an NSPS is set is also given.

TABLE 3-9-A PRIORITIZED NSPS SCHEDULE FOR SULFURIC ACID MIST[a]

YEAR	CUMULATIVE EFFORT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0	1.00	EXPLOSIVE IND (HIGH EXPLOSIVES)	1.599999	20 C17	N1
1980.5	1.00	EXPLOSIVE IND (LOW EXPLOSIVES)	0.006000	20 C18	N5
1981.0	1.00	MIXED FUEL BOILERS (COAL & REFUSE)	0.010000	10 A06	N5

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[a] See Table 3-1-B for Definition of Terms

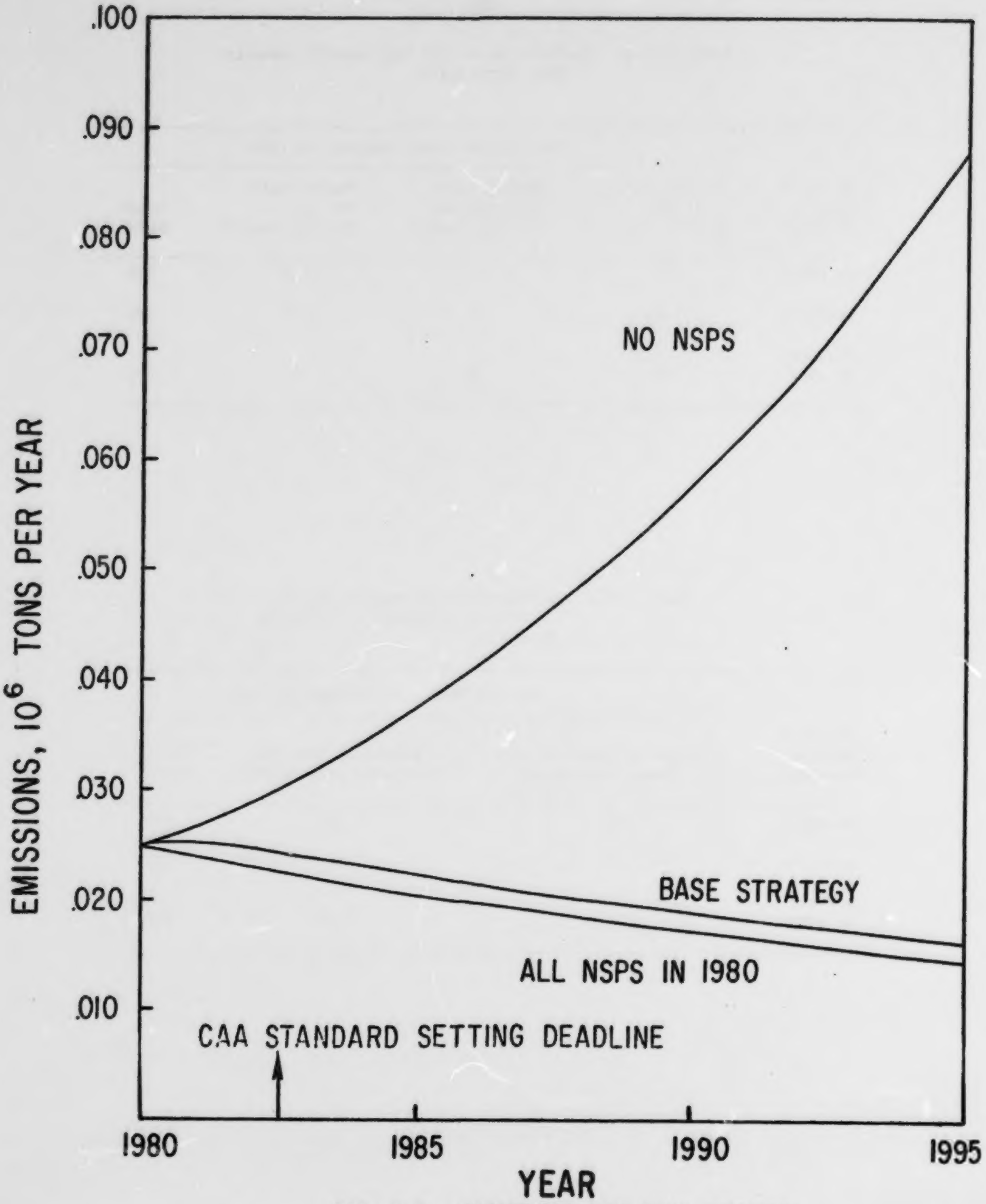

FIG. 3.9. NATIONWIDE ACID MIST EMISSIONS

Table 3.9.B. Sulfuric Acid Mist Air Quality Impacts of NSPS Strategies

	New and Modified Sources in 1990			
Standard Setting Strategy	Number with High Air Quality Impact	Number with Moderate Air Quality Impact	Number with Low Air Quality Impact	Total Number
No NSPS	128	162	0	290
Baseline	128	7	155	290
All set in 1980	128	0	162	290

Table 3.9.C. Mobility/Competiveness Impacts of NSPS Strategies for Sulfuric Acid Mist

	New and Modified Sources in 1990		
Standard Setting Strategy	Number of Sources that Could Have Moved	Number of Sources Precluded from Moving	Total Number
No NSPS	262	28	290
Baseline	4	286	290
All set in 1980	0	290	290

3.1.10 Major Source Category Growth

The number of new and replacement major source category facilities expected to be constructed through 1990 as calculated by equation (2-11) on page 38 is found in Table B-4, Appendix B. One is cautioned not to cite this date out of context of this report as the number of new and replacement facilities represented are hypothetical facilities of average size computed by the algorithm discussed on page 38 of this report.

3.2 POLLUTANT SPECIFIC - MINOR SOURCE

A minor pollutant emission source is a source which has the potential of emitting less than 100 tons per year of all pollutants under examination without application of emission control techniques or processes. Of the 203 source categories evaluated 46 source categories were determined to be minor source categories after screening. Actually there are 51 minor source categories listed in Table A-2, Appendix A. However 5 categories are actually sub-processes or unit operations of a larger facility. Table A-2 indicates which source categories belong to the same representative facilities.

As the 1977 amendments to the CAA specify an evaluation of major source categories and because of time and effort constraints the minor source categories were evaluated only by the mass emission criteria. The mass emission analysis indicated that there were some minor source categories which had a significant potential for mass emission pollutant reduction. There are a number of hydrocarbon and particulate minor source categories which have significant potential emission reduction (i.e., Ts-Tn).

For the mass emission evaluation the nationwide growth in production capacity and corollary growth in nationwide emissions were calculated for minor emission sources for a base year 1980. The nationwide source capacity was typically computed by growing 1975 capacity to 1980 using appropriate new growth (Pc) rates. Where available a "weighed" 1975 state pollutant emission limitation factor (Es) was applied to the 1980 capacity to compute nationwide pollutant emissions. The state emission factor limitation (Es) used was, in most cases, the value computed by TRC[3] in their 1975 analysis of the impact of new source performance standards.

Source category growth and mass emission data by pollutant (i.e., particulate matter, SO_2, NO_2, Hydrocarbons, CO, Lead, Hydrogen Sulfide, Sulfuric Acid Mist and Fluorides) is found in Table A-4, Appendix A. A synopsis of the mass emission potential reductions is found in Table 3-11.

The number of new and replacement minor source category facilities expected to be constructed through 1990 as calculated by equation (2-11) on page 38 is found in Table B-3, Appendix B. One is cautioned not to cite this data out of context of this report as the number of new and replacement facilities represented are hypothetical facilities of average size computed by the algorithm discussed on page 38 of this report.

Table 3-10 Minor Source Category Mass Emission Data

Pollutant	Number of Source Categories	Range of (Ts-Tn) among Source Categories	
		High (Ts-Tn) (ton/yr)	Low (Ts-Tn) (ton/yr)
Particulate Matter	25	23,800	4
Sulfur Dioxide	4	1,000,000	430
Nitrogen Dioxide	6	159,000	270
Hydrocarbon	24	218,000	7
Carbon Monoxide	4	270,000	80
Lead	10	740	150
Fluorides	3	3,100	1,500
Sulfuric Acid Mist	1	1,300	--
Hydrogen Sulfide	1	1	--

3.3 COMBINED POLLUTANT ANALYSIS

In doing the analysis among the pollutants considered, a scheme must be developed to determine the priority pollutant at any point in time. As was described in Section 2, the procedure used here depends on picking the pollutant that is furthest from a pre-defined emission goal. This is the same method that was used in prior work.[2] There are, of course, other pollutant goals which could have been chosen but time did not permit an evaluation of alternatives.

The choice of emission goals is a significant activity since it is possible to emphasize or deemphasize a particular pollutant by choosing a higher or lower emission goal for that pollutant. In prior work,[2] all emission goals were set at zero increase over baseline year emissions. This proved to put an excessively heavy emphasis on NO_2 control since NO_2 was the only pollutant that increased in emissions even under optimum NSPS control. To adjust for this, the emission goal for NO_2 was set at the best level of control achievable while all others were retained at zero growth. In this study a somewhat different approach was used. It appears reasonable to assume that the desired condition is one of all pollutants being as close to the maximum achievable emission reduction as possible. (As was shown previously for sulfur dioxide and nitrogen oxides, this maximum achievable still represents an emission increase over base year (1980) levels.) This implies that the emission goals are set based on the lower limit case of setting all NSPS in 1980. Table 3-11 gives the emission goals computed this way. One modification was made of this information. The designated pollutants (fluorides, acid mist, hydrogen sulfide) and CO are assumed to be of less concern than the remaining criteria pollutants. CO is considered to be a short term pollutant problem resulting from transportation sources as well as stationary sources. Also, fluorides are welfare-related (as opposed to health-related), and there are only three acid mist source categories and two hydrogen sulfide source categories evaluated in this report. For these reasons, it appeared reasonable to deemphasize these pollutants relative to the remaining criteria pollutants. To do this, the emission goals of the aforementioned pollutants were adjusted to zero growth in emissions over 1980 levels.

In selecting the rate at which standards are set, the CAA schedule was used. Under these requirements 25% of the NSPS for the listed sources are to be set within 2 years after the promulgation of the list, 50% in 3 years, and 100% in 4 years. This implies that all NSPS will be promulgated by mid-1982. The standard-setting rate was chosen such that all major sources had NSPS set by mid-1982. This amounted to approximately 60 source effort level standards per year.

Table 3-11. Emission Reduction Goals

Pollutant	Goal[a] (%)
Particulates	-6.4
Sulfur Dioxide	+10.8
Nitrogen Dioxide	+22.0
Hydrocarbons	-29.6
Carbon Monoxide[b]	-22.8
Lead	-19.3
Fluorides[b]	-27.3
Acid Mist[b]	-30.6
Hydrogen Sulfide[b]	-44.7

[a] Based on maximum achievable reduction relative to base year (1980).

[b] Goal modified in baseline strategy to no increase over 1980 level (see text).

One other consideration was used in the analysis. It was assumed that whenever a standard was set for a pollutant from a source category, the standards for all other pollutants from that source were also set. To account for the additional work required to develop standards for other pollutants, it was assumed that a 25% increase in effort would be required for each additional pollutant. Thus, a source emitting 5 pollutants would require as much effort as 2 sources emitting only one pollutant each. This assumption is the same as was used previously.[2] This cumulative effort is specified in the prioritized standard setting lists (Table 3-12, 3-13).

Table 3-12 gives the priority listing for setting NSPS for the Baseline Strategy (i.e., 3 year standard setting period)and is the product of the multipollutant analysis. Standards are set with time once the number of standards or effort levels per period are established. The computer program recomputes the priority pollutant (pollutant furthest from its pre established emission goal) after each standard is established for a source category. Once the priority pollutant has been computed and identified, the computer program goes to the priority pollutant list (there are nine such lists, one for each pollutant) and picks the priority source category for that pollutant from the list for standard setting. It will be recalled that all the pollutant lists have source categories prioritized by the three CAA criteria, mass emissions, health and welfare impact, mobility and competitiveness. For the Base Strategy each pollutant list gives first priority to mass emissions (Ts-Tn), second priority to air quality impact (χ/ATV) and final priority to the mobility/non-mobility distinction.

Examination of Table 3-12 indicates that hydrocarbon standards are set first. This means that the level of hydrocarbon emissions is, during this first time period (1980), furthest from its goal. In the second period (starting in mid-1980) particulate standards are set. This means that since the prioritized list gives priority to source categories with high mass emission reduction (Ts-Tn), there were significant gains in reducing hydrocarbon emissions so that relative to particulate matter, the hydrocarbon emission level was closer to its goal. After the particulate standards are set the computer switches to a different priority pollutant because the high (Ts-Tn) particulate source categories decrease the level of particulate emissions such that particulate matter relative to other pollutants for that period in time is no longer furthest from its goal.

The general trend indicated in Table 3-12 during the first 1½ years is a switching between hydrocarbon and particulate standard setting with hydrocarbon standard setting generally being dominant. This means that other criteria pollutants are generally closer to their goals than are particulate and hydrocarbon emission levels. The switching occurs because the prioritized pollutant lists emphasize setting standards for source categories with high potential mass emission reductions.

The baseline strategy shows little emphasis on NO_2 and CO emission sources. This is due to the fact that many of the larger sources are controlled when the hydrocarbon emissions from that source come up as the priority. Standards for the designated pollutants are typically set in the last year primarily because of less restrictive emission goals and because they are generally unique pollutant emissions (i.e., not picked up for standard setting along with a priority pollutant from a source category).

Table 3.12 Priority List for Combined Pollutant Analysis, Baseline Strategy (Three Year Standard Setting Period)[a]

YEAR	CUMULATIVE EFFORT	POLLUTANT		STANDARD USED XX	CODE	FLAG
1980.0						
	1.00	HC	ETHYLENE OXIDE PLANTS (AIR OXIDATION PROCESS)	1.679999	21 C11	N2
	2.00	HC	ACRYLONITRILE PLANTS	7.919999	20 C06	N2
	2.25	CO		8.000000	20 C06	N5
	3.25	HC	DIMETHYL TEREPHTHALATE PLANTS	0.370000	20 C20	N2
	4.25	HC	CARBON BLACK (FURNACE PROCESS)[b]	0.100000	20 C03	N3
	4.50	PM		1.099999	20 C03	N5
	4.75	CO		2.799999	20 C03	N5
	5.00	HS		0.060000	20 C03	N5
	6.00	HC	FORMALDEHYDE PLANTS[b]	0.064000	20 C08	N3
	6.25	CO		0.157000	20 C08	N5
	7.25	HC	MALEIC ANHYDRIDE	2.620000	20 C23	N2
	7.50	CO		15.599999	20 C23	N5
	8.50	HC	INDUSTRIAL SURFACE COATING (CAN COATING)	0.050000	62 B03	N2
	9.50	HC	(AGG) PETROLEUM REFINERY MISC. SOURCES	0.015000	71 D01	N1
	10.50	HC	INDUSTRIAL SURFACE COATING (PAPER COATING)	0.260000	63 B03	N1
	11.50	HC	DRY CLEANING	24.399994	60 B01	N2
	12.50	HC	FUEL CONVERSION HIGH BTU COAL GASIFICATION	0.680000	21 C20	N2
	12.75	SO		1.559999	21 C20	N4
	13.75	HC	INDUSTRIAL SURFACE COATING (FABRIC COATING)[b]	0.260000	64 B02	N2
	14.75	HC	GRAPHIC ARTS INDUSTRY, (GRAVURE)[b]	65.000000	60 B04	N2
	15.75	HC	BY-PRODUCT COKE OVEN[b]	0.042000	50 A10	N2
	16.00	PM		0.215000	50 A10	N1
	16.25	SO		4.020000	50 A10	N1
	16.50	NO		0.050000	50 A10	N4
	16.75	CO		2.669999	50 A10	N4
	17.75	HC	INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)	2.879999	11 B04	N1
	18.00	PM		0.065000	11 B04	N2
	18.25	SO		2.379999	11 B04	N1
	18.50	NO		0.650000	11 B04	N2
	18.75	CO		8.469999	11 B04	N4
	19.00	PB		0.040000	11 B04	N2
	20.00	HC	PLASTICS AND RESINS (ACRYLIC)	2.400000	20 B17	N5
	21.00	HC	MINERAL WOOL MFG	0.069000	40 D13	N4
	21.25	PM		3.629999	40 D13	N4
	21.50	SO		0.0	40 D13	N6
	21.75	NO		0.080000	40 D13	N6
	22.00	CO		4.713999	40 D13	N5
	23.00	HC	PHTHALIC ANHYDRIDE PLANTS (OXYLENE PROCESS)	0.020000	20 C26	N5
	23.25	PM		2.400000	20 C26	N4
	23.50	SO		9.400000	20 C26	N4
	23.75	CO		3.039999	20 C26	N5
	24.75	HC	STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)	0.0	10 C31	N5
	25.00	SO		0.0	10 C31	N6
	25.25	NO		131.000000	10 C01	N4
	25.50	CO		0.0	10 C01	N6
	26.50	HC	STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)	0.0	10 C02	N5
	26.75	PM		5.139999	10 C02	N6
	27.00	SO		16.000000	10 C02	N4
	27.25	NO		123.000000	10 C02	N4
	27.50	CO		0.0	10 C02	N6
	28.50	HC	INDUSTRIAL SURFACE COATING (AUTOMOBILES)[b]	0.310000	62 B02	N5
	29.50	HC	INDUSTRIAL BOILERS (10-250X10E6 BTU/HR)	0.0	10 A03	N6
	29.75	PM		0.403900	10 A03	N4
	30.00	SO		1.500000	10 A03	N4
	30.25	NO		0.365000	10 A03	N5
	30.50	CO		0.0	10 A03	N6
	30.75	PL		0.000500	10 A03	N5

[a] See Table 3.1.8 on page 52 for definition of terms

[b] At the time of publication, ANL was informed that there may be new data which will alter the impact analysis of this source category.

Table 3.12. (Cont'd)

	31.75	NO	EXPLOSIVE IND (HIGH EXPLOSIVES)[b]	6.400000	20	C17	N5
	32.00	PM		0.260000	20	C17	S5
	32.25	SO		6.000000	20	C17	N2
	32.50	AM		1.599999	20	C17	N1
	33.50	NO	STATIONERY PIPELINE COMPRESSOR ENGINES	15.129999	11	C01	N5
	33.75	PM		0.830000	11	C01	N6
	34.00	SO		5.000000	11	C01	N6
	34.25	CO		9.639999	11	C01	N6
1980.5							
	2.25	PM	(AGG) NON-METALLIC MINING - CLAY	35.519989	41	F01	N1
	3.25	PM	PHOSPHATE ROCK (MINING)[b]	6.000000	44	F01	N1
	4.25	PM	SAND & GRAVEL PROCESS[b]	0.420000	49	A02	N2
	5.25	PM	(AGG) NON-METALLIC MINING - GYPSUM	5.099999	42	F01	N2
	6.25	PM	METALIC MINERALS MINING (COPPER)	0.070000	43	E01	N2
	7.25	PM	(AGG) NON-METALLIC MINING - LIME	6.299999	43	F01	N1
	8.25	PM	(AGG) FEED AND GRAIN MILL INDUSTRY	0.193000	30	E01	S4
	9.25	PM	(AGG) SECONDARY COPPER PLANTS (CONVERTER SMELTING)	0.330000	58	B01	N4
	9.50	SO		87.000000	59	B01	N6
	10.50	PM	(AGG) PHOSPHATE ROCK PREPARATION PLANTS	1.389999	41	D01	N4
	11.50	SO	CHEMICAL WOOD IND. (NSSC)	3.099999	80	A03	N2
	12.50	PB	GREY IRON FOUNDRIES (ELECTRIC ARC)	0.0	50	C02	N3
	12.75	PM		0.070000	50	C02	N3
	13.75	SO	CHEMICAL WOOD PULPING IND. (ACID SULFITE)	3.099999	80	A34	S2
	14.00	PM		2.000000	80	A04	S6
	15.00	HC	BEER PROCESSING PLANTS[b]	0.109000	30	D09	N2
	15.25	PM		0.270000	30	D09	N4
	16.25	PB	METALIC MINERALS MINING (FERROALLOY)	0.003000	42	E01	N2
	16.50	PM		0.600000	42	E01	N2
	17.50	HC	ETHYLENE DICHLORIDE PLANTS (OXYCHLORINATION PROCESS)	0.540090	20	C07	S2
	17.75	CO		0.013000	20	C07	S6
	18.75	HC	ACRYLIC ACID	1.740000	20	C47	S2
	19.00	CO		0.240000	20	C47	S5
	20.00	SO	(AGG) CRUDE OIL AND NATURAL GAS PRODUCTION PLANTS	0.011000	71	E01	N1
	20.25	HC		0.131000	71	E01	N6
	21.25	SO	ETHYLENE	0.014900	20	C31	S5
	21.50	HC		0.330000	20	C31	S6
	22.50	PB	MUNICIPAL INCINERATION < 50T/D	0.0	10	B03	N4
	22.75	PM		0.300000	10	B03	N5
	23.00	SO		0.030000	10	B03	N5
	23.25	NO		1.049999	10	B03	N6
	23.50	HC		0.010000	10	B03	N6
	23.75	CO		35.000000	10	B03	N6
	24.75	HC	VEGETABLE OIL MFG.[b]	15.200000	10	D11	S2
	25.00	PM		0.630000	30	D11	N4
	26.00	HC	CYCLOHEXANOL/CYCLOHEXANONE	1.007000	20	C49	S2
	26.25	CO		1.115000	20	C49	S5
	27.25	HC	PROPYLENE (OXIDE)	0.592000	20	C36	N2
	28.25	SO	EXPLOSIVE IND (LOW EXPLOSIVES)	5.549999	20	C18	S4
	28.50	PM		0.303000	20	C18	S5
	28.75	NO		2.099999	20	C18	N6
	29.00	AM		0.006000	20	C18	S5
	30.00	HC	METHYL METHACRYLATE PLANTS	1.127999	20	C34	N2
	31.00	HC	VINYL ACETATA (ETHYLENE)	0.430000	20	C37	N2
	32.00	HC	TEREPHTHALIC ACID PLANTS	0.210000	20	C27	S3
	33.00	HC	ETHYLENE-PROPYLENE	0.720000	20	D06	N2

Table 3.12. (Cont'd)

1981.0

1.00	HC	ETHYLENE OXIDE PLANTS (OXYGEN OXIDATION PROCESS)	0.430000	22	C11	N2
2.00	HC	VARNISH	0.679000	20	C15	N2
3.00	HC	POLYETHYLENE (HIGH DENSITY)	0.591000	20	B03	N2
3.25	NO		11.250000	20	B03	N2
4.25	HC	METHANOL PLANTS	0.100003	20	C32	N2
4.50	CO		0.100000	20	C32	N5
5.50	HC	CHARCOAL PLANTS	4.799999	20	C16	N2
5.75	PM		4.000000	20	C16	N4
6.00	CO		3.200000	20	C16	N5
7.00	HC	CYCLOHEXANE	0.200000	20	A14	N2
7.25	CO		0.250000	20	A14	N5
8.25	HC	ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE	0.349000	20	C35	N2
8.50	SO		0.004000	20	C35	N6
8.75	NO		0.010000	20	C35	N6
9.75	HC	SYNTHETIC RUBBER (NEOPRENE)	1.200000	20	D07	N2
10.75	HC	ADIPIC ACID PLANTS	0.043000	20	A04	N3
11.00	NO		1.610000	20	A04	N5
11.25	CO		0.115000	20	A04	N5
12.25	HC	CARBON TETRACHLORIDE (METHANE)	0.360000	20	C38	N2
13.25	HC	POLYETHYLENE (LOW DENSITY)	0.240000	20	B04	N2
13.50	PM		0.045000	20	B04	N5
14.50	HC	ACETIC ANHYDRIDE	0.178000	20	C48	N2
14.75	PM		0.001000	20	C48	N6
15.00	CO		0.219000	20	C48	N5
16.00	HC	ETHYL BENZENE	0.050000	20	C30	N2
17.00	HC	INDUSTRIAL SURFACE COATING (METAL COILS COATING)	0.320000	63	B02	N2
18.00	HC	P.T.M. ID. (SHIP & BARGE TRANSFER, GAS. & CRUDE OIL)	0.001300	60	F03	N1
19.00	HC	GRAPHIC ARTS INDUSTRY (FLEXOGRAPHY)	26.000000	60	B05	N2
20.00	HC	PRINTING INK PLANTS	4.799999	20	C19	N5
21.00	HC	SYNTHETIC FIBER INDUSTRY (NYLON)	0.350000	20	B09	N4
21.25	PM		0.750000	20	B09	N4
22.25	SO	MIXED FUEL BOILERS (COAL & REFUSE)	0.140000	10	A06	N5
22.50	PM		0.300000	10	A06	N5
22.75	NO		5.250000	10	A06	N4
23.00	HC		0.0	10	A06	N5
23.25	CO		18.000000	10	A06	N6
23.50	AM		0.010000	10	A06	N5
24.50	HC	PLYWOOD MANUFACTURING PLANT	0.0	80	B01	N4
24.75	PM		0.001300	80	B01	N2
25.75	HC	WHISKEY	0.003055	30	D08	N5
26.00	PM		0.002200	30	D08	N2
27.00	HC	INDUSTRIAL SURFACE COATING (LARGE APPLIANCE COATING)	0.065000	61	B02	N5
28.00	PB	METALIC MINERALS MINING (LEAD MINING)	0.010000	44	E01	N4
28.25	PM		0.700000	44	E01	N4
29.25	HC	GRAPHIC ARTS INDUSTRY (LETTERPRESS)	35.000000	60	B07	N4
30.25	HC	INDUSTRIAL SURFACE COATING (MAGNET WIRE COATING)	0.065000	61	B03	N5
31.25	SO	GLASS MANUFACTURING INDUSTRY (SODA-LIME GLASS)	0.120000	40	D07	N6
31.50	PM		0.022000	40	D07	N6
31.75	NO		0.360000	40	D07	N6
32.75	HC	P.T.M. ID. (BULK GAS. TERMINALS) LOADING TANK TRUCKS/RR CAR	0.003600	60	F04	N4
33.75	PB	METALIC MINERALS MINING (ZINC MINE & CRUSHING)	0.010000	45	E01	N4
34.00	PM		0.700000	45	E01	N4

Table 3.12 (Cont'd)

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1981.5
        2.00    HC      INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)      0.0         12 B04  M6
        2.25    PM                                                                   5.400000    12 B04  M4
        2.50    NO                                                                   0.150000    12 B04  M5
        2.75    CO                                                                   0.0         12 B04  M6
        3.75    NO      POTASH b                                                     0.025000    20 A18  M5
        4.00    PM                                                                   0.660000    20 A18  M2
        5.00    NO      STEEL FOUNDRIES  (ELECTRIC ARC) b                            0.200000    50 D01  M6
        5.25    PM                                                                   0.260000    50 D01  M5
        6.25    PM      (AGG) SECONDARY ALUMINUM PLANTS                              4.309999    51 B12  M2
        7.25    PM      METALIC MINERALS MINING (URANINUM)                           0.110000    47 E01  M3
        8.25    PM      FLY-ASH SINTERING  (SINTERING)                               1.099999    40 D17  M2
        9.25    PM      (AGG) NON-METALLIC MINING - BORON COMPOUNDS                  1.059999    45 F01  M1
       10.25    PM      AMMONIUM SULFATE b                                           1.000000    30 D20  M4
       11.25    PM      METALIC MINERALS MINING (IRON ORE)                           0.500000    41 E01  M4
       12.25    PM      METALIC MINERALS MINING (ALUMINUM)                           0.110000    46 E01  M5
       13.25    PM      GYPSUM MANUFACTURING PLANTS  (CALCINER) b                    0.100000    40 D11  M6
       14.25    PM      SODIUM CARBONATE PLANT  (NATURAL PROCESS)                    0.450000    20 C24  M6
       15.25    FL      HYDROFLUORIC ACID PLANTS                                     0.200000    20 A08  M2
       16.25    SO      (AGG) SECONDARY COPPER PLANTS (BLAST FURNACE)                7.679999    57 B01  M2
       16.50    PM                                                                   0.198000    57 B01  M5
       16.75    FL                                                                   0.078000    57 B01  M2
       17.75    SO      FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)                    0.005000    40 D14  M5
       18.00    PM                                                                   9.299999    40 D14  M4
       18.25    NO                                                                   1.570000    40 D14  M4
       18.50    HC                                                                   2.099999    40 D14  M4
       18.75    CO                                                                   2.240000    40 D14  M6
       19.00    FL                                                                   0.002000    40 D14  M2
       20.00    SO      (AGG) TUNNEL KILNS(COAL),DRYERS AND STORAGE                  0.720000    45 D12  M5
       20.25    PM                                                                   1.299999    45 D12  M4
       20.50    NO                                                                   0.900000    45 D12  M6
       20.75    HC                                                                   0.0         45 D12  M6
       21.00    CO                                                                   1.900000    45 D12  M6
       21.25    FL                                                                   0.300000    45 D12  M1
       22.25    SO      (AGG) PERIODIC KILNS(COAL),DRYERS AND STORAGE                1.200000    46 D12  M5
       22.50    PM                                                                   1.299999    46 D12  M4
       22.75    NO                                                                   1.400000    46 D12  M6
       23.00    HC                                                                   0.0         46 D12  M6
       23.25    CO                                                                   3.200000    46 D12  M6
       23.50    FL                                                                   0.300000    46 D12  M1
       24.50    SO      GLASS MANUFACTURING INDUSTRY  (LEAD GLASS)                   0.080000    40 D19  M6
       24.75    PM                                                                   0.240000    40 D19  M6
       25.00    NC                                                                   0.380000    40 D19  M6
       25.25    PB                                                                   0.060000    40 D19  M5
       26.25    SO      MIXED FUEL BOILERS  (OIL & REFUSE)                           0.010000    10 A07  M6
       26.50    PM                                                                   0.200000    10 A07  M5
       26.75    NO                                                                  13.799999    10 A07  M4
       27.00    HC                                                                   0.285000    10 A07  M5
       27.25    CO                                                                  17.000000    10 A07  M6
       28.25    SO      (AGG) TUNNEL KILNS(OIL),DRYERS AND STORAGE                   0.040000    45 D11  M6
       28.50    PM                                                                   1.299999    45 D11  M4
       28.75    NO                                                                   0.150000    45 D11  M6
       29.00    HC                                                                   0.0         45 D11  M6
       29.25    FL                                                                   0.300000    45 D11  M1
       30.25    SO      (AGG) PERIODIC KILNS(OIL), DRYERS AND STORAGE                0.060000    46 D11  M6
       30.50    PM                                                                   1.360000    46 D11  M4
       30.75    NO                                                                   1.700000    46 D11  M6
       31.00    HC                                                                   0.0         46 D11  M6
       31.25    FL                                                                   0.300000    46 D11  M1
       32.25    HC     CARBON TETRACHLORIDE  (PROPANE)                               0.320000    20 C39  M2
       33.25    HC     CARBON TETRACHORIDE  (CARBON DISULFIDE)                       0.320000    20 C40  M2
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Table 3.12. (Cont'd)

1982.0							
	1.25	HC	PHENOL PLANTS	0.044800	20	C33	M2
	1.50	CO		0.005000	20	C33	M6
	2.50	HC	ACETONE (ISOPROPANOL)	0.130000	20	C42	M2
	3.50	HC	METHYL CHLOROFORM	0.360000	20	C44	M3
	4.50	HC	ACETONE (CUMENE)	0.072000	20	C41	M2
	5.50	HC	POLY-BUTADIENE	0.090000	20	D02	M2
	6.50	HC	PHENOLIC RESINS	0.075000	20	B10	M2
	7.50	HC	ACETATE RAYON	0.350000	20	B13	M2
	8.50	HC	UREA-MELAMINE	0.075000	20	B11	M2
	9.50	HC	ALLYL CHLORIDE	0.200000	20	C46	M3
	10.50	HC	ACETONE (CYANOHYDRIN)	0.020000	20	C43	M2
	11.50	HC	ACETIC ACID (BUTANE)	0.147000	20	A13	M3
	11.75	CO		0.044000	20	A13	M6
	12.75	HC	AMMONIA PLANTS	0.0	21	C13	M5
	13.75	HC	ACETIC ACID (ACETALDEHYDE)	0.196000	20	A11	M5
	14.00	CO		0.040000	20	A11	M6
	15.00	HC	POLYSTYRENE[b]	0.120000	20	B05	M5
	16.00	HC	ABS-SAN RESIN PLANT	0.075000	20	B12	M5
	17.00	HC	ACETIC ACID (METHANOL)	0.150000	20	A12	M5
	18.00	HC	STYRENE	0.016400	20	C45	M5
	18.25	PM		0.004000	20	C45	M6
	18.50	NO		0.004000	20	C45	M6
	19.50	HC	POLYPROPLYENE [b]	0.236000	20	B07	M4
	19.75	PM		0.030000	20	B07	M5
	20.75	HC	PHTHALIC ANHYDRIDE PLANTS (NAPTHALENE PROCESS)	0.100000	20	C25	M5
	21.00	PM		0.990000	20	C25	M3
	21.25	CO		1.000000	20	C25	M5
	22.25	HC	TEXTILE MFG (HEAT SETTING/FINISHING)	4.740000	90	F02	M4
	23.25	HC	SYNTHETIC RUBBER IND. (STYRENE-BUTADIENE) (SBR)	1.099999	20	D01	M4
	23.50	PM		0.120000	20	D01	M5
	24.50	HC	(AGG) ASPHALT ROOFING PLANTS	0.430000	41	B01	M4
	24.75	PM		0.960000	41	B01	M4
	25.00	CO		0.015000	41	B01	M6
	26.00	HC	(AGG) TUNNEL KILNS(GAS),DRYERS AND STORAGE	0.0	45	D10	M6
	26.25	PM		1.299999	45	D10	M4
	26.50	NO		0.150000	45	D10	M6
	26.75	CO		0.300000	45	D10	M6
	27.00	FL		0.300000	45	D10	M1
	28.00	HC	(AGG) PERIODIC KILNS(GAS),DRYERS AND STORAGE	0.0	46	D10	M6
	28.25	PM		1.299999	46	D10	M4
	28.50	NO		0.420000	46	D10	M6
	28.75	CO		0.110000	46	D10	M6
	29.00	FL		0.300000	46	D10	M1
	30.00	NO	FIBERGLASS MFG. PLANTS (TEXTILE PROCESSING)	22.599991	40	D06	M1
	30.25	PM		4.400000	40	D06	M4
	30.50	CO		2.030000	40	D06	M6
	30.75	FL		2.000000	40	D06	M1
	31.75	NO	CERAMIC CLAY MFG	0.200000	40	D10	M6
	32.50	PM		18.000000	40	D10	M4
	32.25	FL		0.300000	40	D10	M2
	33.25	NO	NITRATE FERTILIZER (AMMONIUM NITRATE) PLANTS	0.003000	30	A05	M6
	33.50	PM		0.180000	30	A05	M4

Table 3.12. (Cont'd)

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1982.5
     1.50   NO     STEEL FOUNDRIES  (OPEN HEARTH)                                              0.010000  50 D02  M6
     1.75   PM                                                                                 0.220000  50 D02  M5
     2.75   PM     PESTICIDES MANUFACTURING                                                    0.100000  55 A01  M2
     3.75   PM     (AGG) CASTABLE REFRACTORY PLANTS                                            8.400000  40 D08  M1
     4.00   FL                                                                                 0.130000  40 D08  M1
     5.00   PM     GREY IRON FOUNDRIES  (REVERBERATORY)                                        0.100000  50 C03  M3
     5.25   PB                                                                                 0.0       50 C03  M3
     6.25   PM     BORAX BORIC ACID                                                            1.620000  20 A15  M2
     7.25   PM     (AGG) NON-METALLIC MINING - FLUORSPAR b                                     6.000000  47 F01  M2
     7.50   FL                                                                                 0.100000  47 F01  M2
     8.50   PM     STONE QUARRYING AND PROCESSING b                                            2.599999  40 A01  M1
     9.50   PM     POLYESTER RESIN                                                             0.350000  20 B19  M5
    10.50   PM     STARCH MFGR                                                                 0.020000  30 D18  M5
    11.50   PM      SYNTHETIC FIBERS INDUSTRY (DACRON POLYESTER)                               0.350000  20 B08  M4
    12.50   PM     HYDROGEN FLUORIDE                                                           1.009999  20 A17  M4
    13.50   PM     PERLITE  (VERTICAL FURNACE)                                                 0.210000  40 D12  M5
    14.50   PM     PHOSPHORIC  ACID PLANTS  (THERMAL PROCESS)                                  0.134000  20 A10  M5
    15.50   PM     (AGG) SECONDARY ZINC SMELTERS (RETORT REDUCTION & KETTLE FURNACES           2.580000  51 E01  M4
    15.75   PB                                                                                 0.050000  51 E01  M4
    16.00   FL                                                                                 0.077000  51 E01  M2
    17.00   PM     (AGG) SECONDARY ZINC SMELTERS (HORIZ & REVERB FURNACES)                     0.799000  51 E02  M4
    17.25   PB                                                                                 0.050000  51 E02  M4
    17.50   FL                                                                                 0.023100  51 E02  M2
    18.50   PM     GREY IRON FOUNDRIES  (CUPOLA)                                               0.200000  50 C04  M5
    18.75   CO                                                                                 8.000000  50 C04  M5
    19.00   PB                                                                                 0.030000  50 C04  M2
    20.00   PM     COTTON GINNING                                                              0.480000  30 B01  M4
    21.00   PM     URANIUM REFINING                                                            0.010000  50 F01  M5
    22.00   PM     ALFALFA DEHYDRATING PLANTS                                                  0.236000  30 D01  M5
    23.00   PM     (AGG) CLAY SINTERING PLANTS                                                 1.099999  40 D16  M5
    24.00   PM     ANIMAL FEED DEFLUORINATION                                                  0.062500  30 D10  M5
    24.25   FL                                                                                 0.438000  30 D10  M1
    25.25   PM     UREA                                                                        1.360000  20 B21  M6
    26.25   PM     DETERGENT MANUFACTURING PLANTS                                              0.450000  20 C10  M6
    27.25   PB     GASOLINE ADDITIVES  (ELECTROLYTIC)                                          1.000000  70 F02  S1
    28.25   PB     GASOLINE ADDITIVES  (SODIUM-LEAD)                                           0.890000  70 F01  M1
    29.25   FL     PHOSPHORIC ACID PLANTS  (WET PROCESS)                                       0.005000  20 A07  M2
    30.25   HS     SYNTHETIC FIBERS INDUSTRY (VISCOSE RAYON)                                   1.599999  20 B06  M2
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Table 3-13 is a prioritized standard setting list based on a relaxed standard setting timeframe. The relaxed case assumes the same priority grouping as in the baseline but with a schedule that is relaxed to 1/2 the rate indicated in the CAA (ie., 6 years for Standard Setting). There is a distinct possibility that the actual implementation of NSPS may not meet the CAA schedule due to litigation, the need for review and revision of proposed standards due to public hearing comments, and other factors.

Examination of Table 3-13 shows that after the second period (1980-85) there is some slight change in the order of source category standard setting. Some source categories were up or down one or two slots. This is because relative to the Base Strategy the emission level with time for all pollutants has changed. One can best understand how this change differs among individual pollutants by referring back to Section 3.1 relating to the single pollutant analysis and comparing the growth of single pollutant emission levels with time.

Table 3-14 shows the effectiveness of four strategies on emissions. The first two cases are the upper and lower limit cases described previously and the third is the baseline strategy. The fourth case is the relaxed strategy described above. In the relaxed strategy there is some slippage in overall emission reduction, although all emission levels are still well below the no-NSPS Case (Strategy 1). The greatest percent slippage (ie., increase in emission level) due to the relaxed schedule is for the criteria pollutants; particulate emissions, hydrocarbons, and lead. There is also a significant slippage for sulfuric acid mist and fluorides which is primarily due to the fact that there are a limited number of source categories and standard setting is further delayed allowing an emission level increase by state standards.

Tables 3.15 and 3.16 show the impact of the various strategies on the number of sources with high, moderate, and low air quality impacts and on the number of sources that could have been affected by state air regulations in their siting decisions (i.e. were mobile). As was evidenced in the individual pollutant analyses, the baseline strategy results in a reduction in the number of high air quality impact sources that almost parallels that achieved by the lower limit strategy (i.e. all NSPS immediately). This is due to the high rate of standard-setting. The relaxed schedule (Strategy 4, 30 per year) results in a slight penalty by allowing an increase in the number of high air quality impact sources that are built prior to NSPS promulgation. The Baseline Strategy causes a significant reduction in the number of sources that might move because of air pollution regulation differences. However, there is a noticable penalty as a result of the relaxed schedule where nearly three times as many sources might seek states with minimum air pollution emission limitations.

Table 3-13. Priority List for Combined Pollutant Analysis, Relaxed Strategy (Six Year Standard Setting Period)[a]

YEAR	CUMULATIVE EFFECT	POLLUTANT	SOURCE	STANDARD USED (En)	CODE	FLAG
1980.0						
	1.00	HC	ETHYLENE OXIDE PLANTS (AIR OXIDATION PROCESS)	1.679999	21 C11	N2
	2.00	HC	ACRYLONITRILE PLANTS	7.919999	20 C06	N2
	2.25	CO		8.000000	20 C06	N5
	3.25	HC	DIMETHYL TEREPHTHALATE PLANTS	0.370000	20 C28	N2
	4.25	HC	CARBON BLACK (FURNACE PROCESS)[b]	0.100000	20 C03	N3
	4.50	PM		1.099999	20 C03	N5
	4.75	CO		2.799999	20 C03	N5
	5.00	HS		0.060000	20 C03	N5
	6.00	HC	FORMALDEHYDE PLANTS[b]	0.064000	20 C08	N3
	6.25	CO		0.157000	20 C08	N5
	7.25	HC	MALEIC ANHYDRIDE	2.620000	20 C23	N2
	7.50	CO		15.599999	20 C23	N5
	8.50	HC	INDUSTRIAL SURFACE COATING (CAN COATING)	0.050000	62 B03	N2
	9.50	HC	(AGG) PETROLEUM REFINERY MISC. SOURCES	0.015000	71 D01	N1
	10.50	HC	INDUSTRIAL SURFACE COATING (PAPER COATING)	0.260000	63 B03	N1
	11.50	HC	DRY CLEANING	24.399994	60 B01	N2
	12.50	HC	FUEL CONVERSION HIGH BTU COAL GASIFICATION	0.680000	21 C20	N2
	12.75	SO		1.559999	21 C20	N4
	13.75	HC	INDUSTRIAL SURFACE COATING (FABRIC COATING)[b]	0.260000	64 B02	N2
	14.75	HC	GRAPHIC ARTS INDUSTRY, (GRAVURE)[b]	65.000000	60 B04	N2
	15.75	HC	BY-PRODUCT COKE OVEN[b]	0.042000	50 A10	N2
	16.00	PM		0.215000	50 A10	N1
	16.25	SO		4.020000	50 A10	N1
	16.50	NO		0.050000	50 A10	N4
	16.75	CO		2.669999	50 A10	N4
	17.75	HC	INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)	2.879999	11 B04	N1
	18.00	PM		0.065000	11 D04	N2
	18.25	SO		2.379999	11 B04	N1
	18.50	NO		0.650000	11 B04	N2
	18.75	CO		8.469999	11 B04	N4
	19.00	PB		0.040000	11 B04	N2
1980.5						
	3.00	HC	PLASTICS AND RESINS (ACRYLIC)	2.400000	20 B17	N5
	4.00	HC	MINERAL WOOL MFG	0.869000	40 D13	N4
	4.25	PM		3.629999	40 D13	N4
	4.50	SO		0.0	40 D13	N6
	4.75	NO		0.080000	40 D13	N6
	5.00	CO		4.719999	40 D13	N5
	6.00	HC	PHTHALIC ANHYDRIDE PLANTS (OXYLENE PROCESS)	0.020000	20 C26	N5
	6.25	PM		2.400000	20 C26	N4
	6.50	SO		9.400000	20 C26	N4
	6.75	CO		3.009999	20 C26	N5
	7.75	HC	STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)	0.0	10 C01	N5
	8.00	SO		0.0	10 C01	N6
	8.25	NO		131.000000	10 C01	N4
	8.50	CO		0.0	10 C01	N6
	9.50	HC	STATIONARY INTERNAL COMBUSTION ENGINES (DIESEL & DUAL FUEL)	0.0	10 C02	N5
	9.75	PM		5.139999	10 C02	N6
	10.00	SO		16.000000	10 C02	N4
	10.25	NO		123.000000	10 C02	N4
	10.50	CO		0.0	10 C02	N6
	11.50	HC	INDUSTRIAL SURFACE COATING (AUTOMOBILES)[b]	0.310000	62 B02	N5
	12.50	HC	INDUSTRIAL BOILERS (10-250X10E6 BTU/HR)	0.0	10 A03	N6
	12.75	PM		0.403900	10 A03	N4
	13.00	SO		1.500000	10 A03	N4
	13.25	NO		0.365000	10 A03	N5
	13.50	CO		0.0	10 A03	N6

[a] See Table 3.1.8 on page 52 for definition of terms.

[b] At the time of publication, ANL was informed that there may be new data which will alter the impact analysis of this source category.

Table 3-13. (Cont'd)

YEAR	CUMULATIVE EFFCET	POLLUTANT	SOURCE	STANDARD USED (En)	CODE	FLAG
	13.75	FL		0.000500	10 A03	N5
	14.75	AM	EXPLOSIVE IND (HIGH EXPLOSIVES)[b]	1.599999	20 C17	N1
	15.00	PM		0.260000	20 C17	N5
	15.25	SO		6.000000	20 C17	N2
	15.50	NO		6.400000	20 C17	N5
	16.50	NO	STATIONERY PIPELINE COMPRESSOR ENGINES	15.129999	11 C01	N5
	16.75	PM		0.830000	11 C01	N6
	17.00	SO		5.000000	11 C01	N6
	17.25	CO		9.639999	11 C01	N6
1981.0						
	1.25	PM	(AGG) NON-METALLIC MINING - CLAY	35.519989	41 F01	N1
	2.25	PM	PHOSPHATE ROCK (MINING)[b]	6.000000	44 F01	N1
	3.25	PM	SAND 6 GRAVEL PROCESS [b]	0.420000	40 A02	N2
	4.25	PM	(AGG) NON-METALLIC MINING - GYPSUM	5.099999	42 F01	N2
	5.25	PM	METALIC MINERALS MINING (COPPER)	0.070000	43 E01	N2
	6.25	PM	(AGG) NON-METALLIC MINING - LIME	6.299999	43 F01	N1
	7.25	PM	(AGG) FEED AND GRAIN MILL INDUSTRY	0.193000	30 E01	N4
	8.25	PM	(AGG) SECONDARY COPPER PLANTS (CONVERTER SMELTING)	0.330000	58 B01	N4
	8.50	SO		87.000000	58 B01	N6
	9.50	PM	(AGG) PHOSPHATE ROCK PREPARATION PLANTS	1.389999	41 D01	N4
	10.50	SO	CHEMICAL WOOD IND. (NSSC)	3.099999	90 A03	N2
	11.50	HC	BEER PROCESSING PLANTS [b]	0.109000	30 D09	N2
	11.75	PM		0.270000	30 D09	N4
	12.75	HC	ETHYLENE DICHLORIDE PLANTS (OXYCHLORINATION PROCESS)	0.540000	20 C07	N2
	13.00	CO		0.013000	20 C07	N6
	14.00	HC	ACRYLIC ACID	1.740000	20 C47	N2
	14.25	CO		0.240000	20 C47	N5
	15.25	HC	VEGETABLE OIL MFG.[b]	15.200000	30 D11	N2
	15.50	PM		0.630000	30 D11	N4
	16.50	SO	CHEMICAL WOOD PULPING IND. (ACID SULFITE)	3.099999	80 A04	N2
	16.75	PM		2.000000	80 A04	N4
	17.75	PB	GREY IRON FOUNDRIES (ELECTRIC ARC)	0.0	50 C02	N3
	18.00	PM		0.070000	50 C02	N3
1981.5						
	2.00	HC	CYCLOHEXANOL/CYCLOHEXANONE	1.007000	20 C49	N2
	2.25	CO		1.115000	20 C49	N5
	3.25	HC	PROPYLENE (OXIDE)	0.592000	20 C36	N2
	4.25	HC	METHYL METHACRYLATE PLANTS	1.127999	20 C34	N2
	5.25	HC	VINYL ACETATE (ETHYLENE)	0.430000	20 C37	N2
	6.25	HC	TEREPHTHALIC ACID PLANTS	0.210000	20 C27	N3
	7.25	HC	ETHYLENE-PROPYLENE	0.720000	20 D06	N2
	8.25	HC	ETHYLENE OXIDE PLANTS (OXYGEN OXIDATION PROCESS)	0.430000	22 C11	N2
	9.25	SO	(AGG) CRUDE OIL AND NATURAL GAS PRODUCTION PLANTS	0.011000	71 E01	N1
	9.50	HC		0.131000	71 E01	N6
	10.50	SO	ETHYLENE	0.014900	20 C31	N5
	10.75	HC		0.330000	20 C31	N4
	11.75	PB	METALIC MINERALS MINING (FERROALLOY)	0.003000	47 E01	N2
	12.00	PM		0.600000	42 E01	N2
	13.00	HC	VARNISH [b]	0.679000	20 C15	N2
	14.00	HC	POLYETHYLENE (HIGH DENSITY)	0.591000	20 B03	N2
	14.25	NO		11.250000	20 B03	N2
	15.25	HC	METHANOL PLANTS	0.100000	20 C32	N2
	15.50	CO		0.100000	20 C32	N5
	16.50	HC	CHARCOAL PLANTS	4.799999	20 C16	N2
	16.75	PM		4.000000	20 C16	N4
	17.00	CO		3.200000	20 C16	N5

[b] At the time of publication, ANL was informed that there may be new data which will alter the impact analysis of this source category.

Table 3-13. (Cont'd)

YEAR	CUMULATIVE EFFCST	POLLUTANT	SOURCE	STANDARD USED (En)	CODE	FLAG
1982.0	1.00	PB	MUNICIPAL INCINERATION < 50T/D	0.0	10 B03	N4
	1.25	PM		0.300000	10 B03	N5
	1.50	SO		0.030000	10 B03	N5
	1.75	NO		1.049999	10 B03	N6
	2.00	HC		0.010000	10 B03	N6
	2.25	CO		35.000000	10 B03	N6
	3.25	HC	CYCLOHEXANE	0.200000	20 A14	N2
	3.50	CO		0.250000	20 A14	N5
	4.50	SO	EXPLOSIVE IND (LOW EXPLOSIVES)	5.549999	20 C18	N4
	4.75	PM		0.380000	20 C18	N5
	5.00	NO		2.099999	20 C18	N6
	5.25	AM		0.006000	20 C18	N5
	6.25	HC	ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE	0.349000	20 C35	N2
	6.50	SO		0.004000	20 C35	N6
	6.75	NO		0.010000	20 C35	N6
	7.75	HC	SYTHETIC RUBBER (NEOPRENE)	1.200000	20 D07	N2
	8.75	HC	ADIPIC ACID PLANTS	0.043000	20 A04	N3
	9.00	NO		1.610000	20 A04	N5
	9.25	CO		0.115000	20 A04	N5
	10.25	HC	CARBON TETRACHLORIDE (METHANE)	0.360000	20 C38	N2
	11.25	HC	POLYETHYLENE (LOW DENSITY)	0.240000	20 B04	N2
	11.50	PM		0.045000	20 B04	N5
	12.50	HC	ACETIC ANHYDRIDE	0.178000	20 C48	N2
	12.75	PM		0.001000	20 C48	N6
	13.00	CO		0.219000	20 C48	N5
	14.00	HC	ETHYL BENZENE	0.050000	20 C30	N2
	15.00	HC	INDUSTRIAL SURFACE COATING (METAL COILS COATING)	0.320000	63 B02	N2
	16.00	HC	P.T.M. ID. (SHIP & BARGE TRANSFER, GAS. & CRUDE OIL)	0.001300	60 F03	N1
	17.00	HC	GRAPHIC ARTS INDUSTRY (FLEXOGRAPHY)[b]	26.000000	60 B05	N2
1982.5	1.00	SO	MIXED FUEL BOILERS (COAL & REFUSE)	0.140000	10 A06	N5
	1.25	PM		0.300000	10 A06	N5
	1.50	NO		5.250000	10 A06	N4
	1.75	HC		0.0	10 A06	N5
	2.00	CO		18.000000	10 A06	N6
	2.25	AM		0.010000	10 A06	N5
	3.25	HC	PRINTING INK PLANTS	4.799999	20 C19	N5
	4.25	HC	SYNTHETIC FIBER INDUSTRY (NYLON)	0.350000	20 B09	N4
	4.50	PM		0.750000	20 B09	N4
	5.50	HC	PLYWOOD MANUFACTURING PLANT	0.0	80 B01	N4
	5.75	PM		0.001300	80 B01	N2
	6.75	HC	WHISKEY	0.000055	30 D08	N5
	7.00	PM		0.002200	30 D08	N2
	8.00	HC	INDUSTRIAL SURFACE COATING (LARGE APPLIANCE COATING)[b]	0.065000	61 B02	N5
	9.00	SO	GLASS MANUFACTURING INDUSTRY (SODA-LIME GLASS)	0.120000	40 D07	N6
	9.25	PM		0.022000	40 D07	N6
	9.50	NO		0.360000	40 D07	N6
	10.50	PB	METALIC MINERALS MINING (LEAD MINING)	0.010000	44 E01	N4
	10.75	PM		0.700000	44 E01	N4
	11.75	HC	GRAPHIC ARTS INDUSTRY (LETTERPRESS)[b]	35.300000	60 B07	N4
	12.75	HC	INDUSTRIAL SURFACE COATING (MAGNET WIRE COATING)	0.065000	61 B03	N5
	13.75	PB	METALIC MINERALS MINING (ZINC MINE & CRUSHING)	0.310000	45 E01	N4
	14.00	PM		0.700000	45 E01	N4
	15.00	HC	P.T.M. ID. (BULK GAS. TERMINALS) LOADING TANK TRUCKS/RR CAR	0.003600	60 F04	N4
	16.00	HC	INDUSTRIAL INCINERATION (IND ORGANIC LIQUID WASTE INC)	0.0	12 B04	N6
	16.25	PM		5.400000	12 B04	N4
	16.50	NO		0.150000	12 B04	N5
	16.75	CC		0.0	12 B04	N6
	17.75	NO	POTASH[b]	0.025000	20 A18	N5
	18.00	PM		0.660000	20 A18	N2

[b] At the time of publication, ANL was informed that there may be new data which will alter the impact analysis of this source category.

Table 3-13. (Cont'd)

YEAR	CUMULATIVE EFFECT	POLLUTANT	SOURCE	STANDARD USED (En)	CODE	FLAG
1983.0						
	2.00	NO	STEEL FOUNDRIES (ELECTRIC ARC)[b]	0.200000	50 D01	N6
	2.25	PM		0.260000	50 D01	N5
	3.25	PM	(AGG) SECONDARY ALUMINUM PLANTS	4.309999	51 B12	N2
	4.25	PM	METALIC MINERALS MINING (URANIUM)	0.110000	47 E01	N3
	5.25	PM	FLY-ASH SINTERING (SINTERING)	1.099999	40 D17	N2
	6.25	PM	(AGG) NON-METALLIC MINING - BORON COMPOUNDS	1.059999	45 F01	N1
	7.25	PM	AMMONIUM SULFATE	1.000000	30 D20	N4
	8.25	PM	METALIC MINERALS MINING (IRON ORE)	0.500000	41 E01	N4
	9.25	PM	METALIC MINERALS MINING (ALUMINUM)	0.110000	46 E01	N5
	10.25	PM	GYPSUM MANUFACTURING PLANTS (CALCINER)[b]	0.100000	40 D11	N6
	11.25	PM	SODIUM CARBONATE PLANT (NATURAL PROCESS)	0.450000	20 C24	N6
	12.25	FL	HYDROFLUORIC ACID PLANTS	0.200000	20 A08	N2
	13.25	SO	(AGG) SECONDARY COPPER PLANTS (BLAST FURNACE)	7.679999	57 B01	N2
	13.50	PM		0.198000	57 B01	N5
	13.75	FL		0.078000	57 B01	N2
	14.75	SO	FIBERGLASS MFG. PLANTS (WOOL PROCESSING)	0.005000	40 D14	N5
	15.00	PM		5.299999	40 D14	N4
	15.25	NO		1.570000	40 D14	N4
	15.50	HC		2.099999	40 D14	N4
	15.75	CO		2.240000	40 D14	N6
	16.00	FL		0.002000	40 D14	N2
	17.00	SO	(AGG) TUNNEL KILNS(COAL),DRYERS AND STORAGE	0.720000	45 D12	N5
	17.25	PM		1.299999	45 D12	N4
	17.50	NO		0.900000	45 D12	N6
	17.75	HC		0.0	45 D12	N6
	18.00	CO		1.900030	45 D12	N6
	18.25	FL		0.300000	45 D12	N1
1983.5						
	2.25	HC	CARBON TETRACHLORIDE (PROPANE)	0.320000	20 C39	N2
	3.25	HC	CARBON TETRACHORIDE (CARBON DISULFIDE)	0.320000	20 C40	N2
	4.25	HC	PHENOL PLANTS	0.044800	20 C13	N2
	4.50	CO		0.005000	20 C33	N6
	5.50	HC	ACETONE (ISOPROPANOL)	0.130000	20 C42	N2
	6.50	HC	METHYL CHLOROFORM	0.360000	20 C44	N3
	7.50	HC	ACETONE (CUMENE)	0.072000	20 C41	N2
	8.50	HC	POLY-BUTADIENE	0.090000	20 D02	N2
	9.50	HC	PHENOLIC RESINS	0.075000	20 B10	N2
	10.50	HC	ACETATE RAYON	0.350000	20 B13	N2
	11.50	HC	UREA-MELAMINE	0.075000	20 B11	N2
	12.50	HC	ALLYL CHLORIDE	0.200000	20 C46	N3
	13.50	HC	ACETONE (CYANOHYDRIN)	0.020000	20 C43	N2
	14.50	HC	ACETIC ACID (BUTANE)	0.147000	20 A13	N3
	14.75	CO		0.084000	20 A13	N6
	15.75	HC	AMMONIA PLANTS	0.0	21 C11	N5
	16.75	HC	ACETIC ACID (ACETALDEHYDE)	0.196000	20 A11	N5
	17.00	CO		0.040000	20 A11	N6
1984.0						
	1.00	HC	POLYSTYRENE[b]	0.120000	20 B05	N5
	2.00	HC	ABS-SAN RESIN PLANT	0.075000	20 B12	N5
	3.00	HC	ACETIC ACID (METHANOL)	0.150000	20 A12	N5
	4.00	HC	STYRENE	0.016400	20 C45	N5
	4.25	PM		0.004000	20 C45	N6
	4.50	NO		0.004000	20 C45	N6
	5.50	HC	POLYPROPLYENE[b]	0.236000	20 B07	N4
	5.75	PM		0.030000	20 B07	N5
	6.75	HC	PHTHALIC ANHYDRIDE PLANTS (NAPTHALENE PROCESS)	0.100000	20 C25	N5
	7.00	PM		0.990000	20 C25	N1
	7.25	CO		1.000000	20 C25	N5
	8.25	HC	TEXTILE MFG (HEAT SETTING/FINISHING)	4.740000	90 F02	N4
	9.25	HC	SYNTHETIC RUBBER IND. (STYRENE-BUTADIENE) (SBR)	3.099999	20 D01	N4
	9.50	PM		0.120000	20 D01	N5
	10.50	HC	(AGG) ASPHALT ROOFING PLANTS	0.430000	41 B01	N4
	10.75	PM		0.960000	41 B01	N4

[b] At the time of publication, ANL was informed that there may be new data which will alter the impact analysis of this source category.

Table 3-13. (Cont'd)

YEAR	CUMULATIVE EFFECT	POLLUTANT	SOURCE	STANDARD USED (En)	CODE	FLAG
	11.00	CO		0.015000	41 B01	N6
	12.00	HC	MIXED FUEL BOILERS (OIL & REFUSE)	0.285000	10 A07	N5
	12.25	PM		0.200000	10 A07	N5
	12.50	SO		0.010000	10 A07	N6
	12.75	NO		13.799999	10 A07	N4
	13.00	CO		17.000000	10 A07	N6
	14.00	HC	(AGG) TUNNEL KILNS(OIL),DRYERS AND STORAGE	0.0	45 D11	N6
	14.25	PM		1.299999	45 D11	N4
	14.50	SO		0.040000	45 D11	N6
	14.75	NO		0.150000	45 D11	N6
	15.00	FL		0.300000	45 D11	N1
	16.00	HC	(AGG) TUNNEL KILNS(GAS),DRYERS AND STORAGE	0.0	45 D10	N6
	16.25	PM		1.299999	45 D10	N4
	16.50	NO		0.150000	45 D10	N6
	16.75	CO		0.300000	45 D10	N6
	17.00	FL		0.300000	45 D10	N1
1984.5						
	1.00	HC	(AGG) PERIODIC KILNS(COAL),DRYERS AND STORAGE	0.0	46 D12	N6
	1.25	PM		1.299999	46 D12	N4
	1.50	SO		1.200000	46 D12	N5
	1.75	NO		1.400000	46 D12	N6
	2.00	CO		3.200000	46 D12	N6
	2.25	FL		0.300000	46 D12	N1
	3.25	HC	(AGG) PERIODIC KILNS(GAS),DRYERS AND STORAGE	0.0	46 D10	N6
	3.50	PM		1.299999	46 D10	N4
	3.75	NO		0.420000	46 D10	N6
	4.00	CO		0.110000	46 D10	N6
	4.25	FL		0.300000	46 D10	N1
	5.25	HC	(AGG) PERIODIC KILNS(OIL), DRYERS AND STORAGE	0.0	46 D11	N6
	5.50	PM		1.360000	46 D11	N4
	5.75	SO		0.060000	46 D11	N6
	6.00	NO		1.700000	46 D11	N6
	6.25	FL		0.300000	46 D11	N1
	7.25	SO	GLASS MANUFACTURING INDUSTRY (LEAD GLASS)	0.080000	40 D19	N6
	7.50	PM		0.240000	40 D19	N6
	7.75	NO		0.380000	40 D19	N6
	8.00	PB		0.060000	40 D19	N5
	9.00	NO	FIBERGLASS MFG. PLANTS (TEXTILE PROCESSING)	22.599991	40 D06	N1
	9.25	PM		4.400000	40 D06	N4
	9.50	CO		2.030000	40 D06	N6
	9.75	FL		2.000000	40 D06	N1
	10.75	NO	CERAMIC CLAY MFG	0.200000	40 D10	N6
	11.00	PM		18.000000	40 D10	N4
	11.25	FL		0.300000	40 D10	N2
	12.25	NO	NITRATE FERTILIZER (AMMONIUM NITRATE) PLANTS	0.003000	30 A05	N6
	12.50	PM		0.180000	30 A05	N4
	13.50	NO	STEEL FOUNDRIES (OPEN HEARTH)	0.010000	50 D02	N6
	13.75	PM		0.220000	50 D02	N5
	14.75	PM	PESTICIDES MANUFACTURING	0.100000	55 A01	N2
	15.75	PM	(AGG) CASTABLE REFRACTORY PLANTS	8.400000	40 D08	N1
	16.00	FL		0.130000	40 D08	N1
	17.00	PM	GREY IRON FOUNDRIES (REVERBERATORY)	0.100000	50 C03	N3
	17.25	PB		0.0	50 C03	N3
1985.0						
	1.25	PM	BORAX BORIC ACID	1.620000	20 A15	N2
	2.25	PM	(AGG) NON-METALLIC MINING - FLUORSPAR[b]	6.000000	47 F01	N2
	2.50	FL		0.100000	47 F01	N2
	3.50	PM	STONE QUARRYING AND PROCESSING[b]	2.599999	40 A01	N1
	4.50	PM	POLYESTER RESIN	0.350000	20 B19	N5
	5.50	PM	STARCH MFGR	0.020000	30 D18	N5
	6.50	PM	SYNTHETIC FIBERS INDUSTRY (DACRON POLYESTER)	0.350000	20 B08	N4
	7.50	PM	HYDROGEN FLUORIDE	1.009999	20 A17	N4

[b] At the time of publication, ANL was informed that there may be new data which will alter the impact analysis of this source category.

Table 3-13. (Cont'd)

YEAR	CUMULATIVE EFFECT	POLLUTANT	SOURCE	STANDARD USED (En)	CODE	FLAG
	8.50	PM	PERLITE (VERTICAL FURNACE)	0.210000	40 D12	N5
	9.50	PM	PHOSPHORIC ACID PLANTS (THERMAL PROCESS)	0.134000	20 A10	N5
	10.50	PM	(AGG) SECONDARY ZINC SMELTERS (RETORT REDUCTION & KETTLE FURNACES	2.580000	51 E01	N4
	10.75	PB		0.050000	51 E01	N4
	11.00	FL		0.077000	51 E01	N2
	12.00	PM	(AGG) SECONDARY ZINC SMELTERS (HORIZ & REVERB FURNACES)	0.799000	51 E02	N4
	12.25	PB		0.050000	51 E02	N4
	12.50	FL		0.023100	51 E02	N2
	13.50	PM	GREY IRON FOUNDRIES (CUPOLA)	0.200000	50 C04	N5
	13.75	CO		8.000000	50 C04	N5
	14.00	PB		0.030000	50 C04	N2
	15.00	PM	COTTON GINNING	0.480000	30 B01	N4
	16.00	PM	URANIUM REFINING	0.010000	50 F01	N5
	17.00	PM	ALFALFA DEHYDRATING PLANTS	0.236000	30 D01	N5
1985.5						
	1.00	PM	(AGG) CLAY SINTERING PLANTS	1.099999	40 D16	N5
	2.00	PM	ANIMAL FEED DEFLUORINATION	0.062500	30 D10	N5
	2.25	FL		0.438000	30 D10	N1
	3.25	PM	UREA	1.360000	20 B21	N6
	4.25	PM	DETERGENT MANUFACTURING PLANTS	0.450000	20 C10	N6
	5.25	FL	PHOSPHORIC ACID PLANTS (WET PROCESS)	0.005000	20 A07	N2
	6.25	PB	GASOLINE ADDITIVES (ELECTROLYTIC)	1.000000	70 F02	N1
	7.25	PB	GASOLINE ADDITIVES (SODIUM-LEAD)	0.890000	70 F01	N1
	8.25	HS	SYNTHETIC FIBERS INDUSTRY (VISCOSE RAYON)	1.599999	20 B06	N2

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[b] At the time of publication, ANL was informed that there may be new data which will alter the impact analysis of this source category.

Table 3-14. Impacts of Prioritization Strategies on Emissions

		Change in 1990 Emissions Over Base Year, (1980), %								
	Standards per year	PM	SO_2	NO_2	HC	CO	PB	AM[2]	H_2S	FL
1. No NSPS	0	29.2	19.1	55.6	70.1	29.1	56.1	135.0	27	34.7
2. All NSPS Immediately	0	-6.4	10.8	22	-29.6	-22.8	-19.3	-30.6	-44.7	-27.3
3. Baseline Strategy	60	-.83	11.4	23.8	-23.9	-21.3	-16.5	-24.3	-40.9	-15
4. Baseline Strategy/ Relaxed Schedule	30	3.5	11.9	25.5	-21.2	-21.3	-13.8	-17.9	-40.5	-4.4

[2] Sulfuric acid mist

Table 3.15 Air Quality Impacts of NSPS Strategies

Standard Setting Strategy	New and Modified Sources in 1990[a]			
	Number With High Air Quality Impact	Number With Moderate Air Quality Impact	Number With Low Air Quality Impact	Total Number
1. No NSPS	19,067	25,370	726	45,163
2. All NSPS Immediately	3,957	35,623	5,583	45,163
3. Baseline Strategy (60 per year)	4,709	35,209	5,245	45,163
4. Baseline Strategy/ Relaxed Schedule (30 per year)	5,626	34,774	4,763	45,163

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[a] Hypothetical average-sized sources

Table 3.16 Mobility/Competitiveness Impacts of NSPS Strategies

Standard Setting Strategy	New and Modified Sources in 1990[a]		
	Number of Sources That Could Have Moved	Number of Sources Precluded From Moving	Total Number
1. No NSPS	16,970	28,193	45,163
2. All NSPS Immediately	0	45,163	45,163
3. Baseline Strategy (60 per year)	1,466	43,697	45,163
4. Baseline Strategy/ Relaxed Schedule (30 per year)	3,186	41,977	45,163

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[a] Hypothetical average-sized sources.

4.0 SUMMARY AND CONCLUSIONS

4.1 GENERAL

- The analysis procedure requires that decisions be made in two critical areas: an explicit statement must be made regarding the priority of the CAA criteria; individual pollutant emission goals must be established.
- The Base Strategy gives first priority to mass emission reduction, second priority to air quality impact reduction and final priority to reducing the mobility of stationary source siting because of differences in state air regulations.
- The Base Strategy provides a more restrictive pollutant emission goal for particulate matter, Sulfur Dioxide, Nitrogen Dioxide, Hydrocarbons and Lead than it does for Carbon Monoxide, Fluorides, Hydrogen Sulfide and Sulfuric Acid Mist.

4.2 SINGLE POLLUTANT ANALYSIS

- The single pollutant analysis indicates the best case for single pollutant mass emission reduction under the Baseline Strategy and also indicates the level of emissions (in 1990) used as goals in the multipollutant analysis.
- Irrespective of the strategy used, mass emissions will increase over 1980 levels for Sulfur Dioxide and Nitrogen Dioxide. The Baseline Strategy does significantly reduce the level of emissions for all pollutants and parallels the best case (all NSPS in 1980).
- Irrespective of the strategy used, for all pollutants there will be a slight increase in emission levels after 1980 during the initial Standard Setting period. The level of emissions decreases and parallels the best case (all-NSPS in 1980) for all pollutants except NO_2 and SO_2. The initial rise in emissions is minimized because potential mass emission reduction has priority in standard setting.
- Hydrocarbon, sulfuric acid mist, hydrogen sulfide and fluoride source categories offer the highest potential for mass emission reduction.

- If controlled only by state regulations, the pollutants which have the greatest emissions increase during the 1980-1990 period are (in order of magnitude) sulfuic acid mist, hydrocarbon, Pb, NO_2, fluorides,particulate matter, CO, H_2S, and SO_2.
- In order to reverse the trend of increasing emission levels for SO_2 and NO_2 (which occurs in the best case of all NSPS Set in 1980) more restrictive NSPS emission limitations must be developed.

4.3 MULTIPOLLUTANT ANALYSIS

- The choice of emission goals plays a significant role in the multi-pollutant strategies. The Baseline Strategy tested here uses the best possible emission reduction goals (all NSPS set in 1980) for the criteria pollutants except CO. This results in a standard-setting priority ranking that is heavily dominated by hydrocarbon and particulate emission source categories.
- As with the single pollutant analyses, the prioritization of source categories does not play a major role in determining the impacts of the NSPS program when the CAA schedule is met. The rate of standard-setting is high enough to discount any relative rankings. (see Table 3-14, 15, 16). This is evident by comparing the Base Strategy results with the best case (all NSPS set in 1980).
- At a relaxed standard setting schedule (6 years instead of 3 years) there are some minor penalties in mass emissions (notably fluorides particulate, sulfuric acid mist). However fluorides and sulfuric acid mist are also influenced by a less restrictive mass emission goal. There are also some pentalties resulting in an increase in the number of mobile sources. The air quality impact does not appear to suffer noticably.
- At a relaxed standard setting schedule there is some slight change in the order of source categories on the standard setting list (relative to the unrelaxed schedule). This is due to a change in the pollutant emission levels resulting from a delay in standard setting.
- The standard setting schedule required by the CAA results in

emissions, air quality impacts, and mobility impacts that are close to the maximum (all NSPS in 1980) level. This is due to the high standard setting pace.

4.4 MINOR SOURCE CATEGORIES

- There are some minor source categories (<100 ton/yr. of all pollutant emissions with no controls) which account for a significant level of mass pollutant emissions and potential mass pollutant emission reduction. This is especially true regarding hydrocarbon and particulate emission source categories. These are typically small source categories (as measured by production units/year) but in the aggregate they account for significant emissions.

APPENDIX A

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Table A-2 Minor Sources A-3

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Table A-3 Model IV Major Source: 1980-1990 . . . . A-8

Table A-4 Model IV Minor Source: 1980-1990 . . . . A-36

Table A-1. Source Categories Not Evaluated

- Polyurethane Foam
- Leather Product Plant
- Wood Preserving Industry
- Agricultural Incineration
- Silicones Plants
- Polyvinyl Acetate Plants
- Styrene Copolymer Plants
- Cellulosic Plants
- Acetate Plants
- Polyvinyl Mtyral
- Fuel Conversion, Low Btu Gas
- Fine Chemicals
  - Flavors
  - Fragrances
- Functional Chemicals
  - Adhesives
  - Cleaning Compounds
  - Surfactants
  - Catalysts
  - Metallic Soaps
  - Rubber Chemicals
  - Chelating Agents
  - Enzymes
  - Inhibitors
  - Flame Retardants
  - UV Absorbers
  - Food Additives
  - Photographic
  - Laboratory Chemical
  - Textile Chemical
  - Paint Chemical
  - Paper Chemical
  - Flotation Reagents
  - Automobile Chemical
  - Water Treatment Chemical
  - Metal Treatment Chemical
  - Plating Chemical
  - Printing Chemical
  - Wood Chemicals
- Non-Industrial Surface Coating
- Wood Furniture and Fixture Plants
- Chloroprene
- Synthetic Rubber - Butyl (IIR)
- Synthetic Rubber - Nitrile (NBR)
- Intermediates and Dyes
- Synthetic Fibers - Acrylic/Modacrylic
- Synthetic Fibers - Polyolefins

Table A-2. Minor Sources

				EMISSIONS (TONS/YR) REQUIRED SOURCE SIZE (PROCESS UNITS/YR)							
		PM	SO	NO	HC	CO	PB	AM	HS	FL	Representative Facility Size (Process Units/yr)
10 A01	FOSSIL FUEL BOILERS (<0.3X10E6 BTU/HR)										0.0011
	X →	0.0142	0.0562	0.0606	0.0015	0.0209	0.0	0.0	0.0	0.0	
	Y →	7.4074	1.8692	1.7391	71.4286	5.0378	0.0	0.0	0.0	0.0	
10 A02	COMMERCIAL BOILERS (0.3-10X10E6 BTU/HR)										0.0613
		24.5280	28.7286	9.0140	0.8033	1.8457	0.0	0.0	0.0	0.0245	
		0.2500	0.2134	0.6803	7.6336	3.3223	0.0	0.0	0.0	250.0000	
10 E01	WASTE OIL BOILERS										0.5000
		2.5000	39.2500	15.0000	0.2500	1.2500	4.2500	0.0	0.0	0.0	
		20.0000	1.2739	3.3333	200.0000	40.0000	11.7647	0.0	0.0	0.0	
20 A16	LITHIUM COMPOUNDS										0.7770
		0.6604	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		117.6470	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20 A19	SODIUM CHLORIDE										0.2630
		48.4950	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		0.5464	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
20 A20	LEAD OXIDES										0.0300
		6.0000	0.0	0.0	0.0	0.0	3.3000	0.0	0.0	0.0	
		0.4545	0.0	0.0	0.0	0.0	0.9091	0.0	0.0	0.0	
20 B14	POLYVINYL ALCOHOL PLANTS										0.0380
		0.0	0.0	0.0	62.7000	0.0	0.0	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0606	0.0	0.0	0.0	0.0	0.0	
20 B15	POLYCARBONATES PLANTS										0.0280
		0.0	0.0	0.0	1.5400	0.0	0.0	0.0	0.0	0.0	
		0.0	0.0	0.0	1.8182	0.0	0.0	0.0	0.0	0.0	
20 B16	EPOXY RESIN PLANT (UNSPECIFIED)										0.0204
		0.0	0.0	0.0	20.4000	0.0	0.0	0.0	0.0	0.0	
		0.0	0.0	0.0	0.1000	0.0	0.0	0.0	0.0	0.0	
20 B19	ALKYD										0.0031
		0.0	0.0	0.0	2.6505	0.0	0.0	0.0	0.0	0.0	
		0.0	0.0	0.0	0.1170	0.0	0.0	0.0	0.0	0.0	
20 B20	PLASTICS AND RESINS (POLYAMIDES)										0.0046
		34.5000	0.0	0.0	16.1000	0.0	0.0	0.0	0.0	0.0	
		0.0133	0.0	0.0	0.0286	0.0	0.0	0.0	0.0	0.0	
20 C09	PAINT MFG.										0.0031
		1.5320	0.0	0.0	45.9600	0.0	0.0	0.0	0.0	0.0	
		0.2000	0.0	0.0	0.0067	0.0	0.0	0.0	0.0	0.0	
20 D09	POLY-ISOPRENE(IR)										0.0270
		0.0	0.0	0.0	60.7500	0.0	0.0	0.0	0.0	0.0	
		0.0	0.0	0.0	0.0444	0.0	0.0	0.0	0.0	0.0	
21 A0	HYDROCHLORIC ACID INDUSTRY										0.0239
		41.7410	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		0.0571	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

X Uncontrolled Specified Pollutant Emission by Representative Facility Size (Ton/Yr).

Y Facility Size Required for Source Category to Qualify as Major Source (≥100 Ton Pollutant/Yr) for Specified Pollutant (Process Units/Yr).

Table A-2. (Cont'd)

			EMISSIONS (TONS/YR) REQUIRED SOURCE SIZE (PROCESS UNITS/YR)									
		PM	SO	NO	HC	CO	PB	AM	HS	FL	Representative Facility Size (Process Units/Yr)	
21 A21	LEAD PIGMENTS MFGR. (RED LEAD)										0.0030	
	X →	0.0	0.0	0.0	0.0	0.0	1.3500	0.0	0.0	0.0		
	Y →	0.0	0.0	0.0	0.0	0.0	0.2222	0.0	0.0	0.0		
22 A21	LEAD PIGMENTS MFGR (WHITE LEAD)										0.0004	
		0.0	0.0	0.0	0.0	0.0	0.1000	0.0	0.0	0.0		
		0.0	0.0	0.0	0.0	0.0	0.4000	0.0	0.0	0.0		
23 A21	LEAD PIGMENTS MFGR (LEAD CHROMATE)										0.0070	
		0.0	0.0	0.0	0.0	0.0	0.4200	0.0	0.0	0.0		
		0.0	0.0	0.0	0.0	0.0	1.6667	0.0	0.0	0.0		
30 D03	MEAT SMOKEHOUSES										0.0026	
		0.3900	0.0	0.0	0.4550	0.7800	0.0	0.0	0.0	0.0		
		0.6667	0.0	0.0	0.5714	0.3333	0.0	0.0	0.0	0.0		
30 D05	FISH PROCESSING										0.0029	
		0.5870	0.0	0.0	0.0	0.0	0.0	0.0	0.0851	0.0		
		0.5000	0.0	0.0	0.0	0.0	0.0	0.0	3.4483	0.0		
30 D12	DIRECT FIRING OF MEATS										0.0000	
		11.3880	0.0	0.0	3.5695	0.0	0.0	0.0	0.0	0.0		
		0.0000	0.0	0.0	0.0000	0.0	0.0	0.0	0.0	0.0		
30 D17	DEEP FAT FRYING										0.0038	
		22.4315	0.0	0.0	14.8340	0.0	0.0	0.0	0.0	0.0		
		0.0169	0.0	0.0	0.0256	0.0	0.0	0.0	0.0	0.0		
30 D19	PHARMACEUTICAL										0.0005	
		0.1459	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		0.3361	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
31 D04	COFFEE ROASTING (DIRECT)										0.0073	A
		27.7400	0.0	0.3650	0.0	0.0	0.0	0.0	0.0	0.0		
		0.0263	0.0	2.0000	0.0	0.0	0.0	0.0	0.0	0.0		
32 D04	COFFEE ROASTING (INDIRECT)										0.0073	B*
		15.3300	0.0	0.3650	0.0	0.0	0.0	0.0	0.0	0.0		
		0.0476	0.0	2.0000	0.0	0.0	0.0	0.0	0.0	0.0		
33 D04	COFFEE ROASTING (STONER/COOLER)										0.0073	A B*
		5.1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		0.1429	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
34 D04	COFFEE ROASTING (SPRAY DRYER)										0.0073	A B*
		5.1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		0.1429	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
40 D15	FRIT MFG (ROTARY FURNACE)										0.0086	
		32.1022	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0279		
		0.0112	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0860		
40 D18	GLASS MANUFACTURING INDUSTRY (OPAL GLASS)										0.0051	
		5.7120	6.8340	19.5075	0.0	0.0	0.0	0.0	0.0	51.0000		
		0.0893	0.0746	0.0261	0.0	0.0	0.0	0.0	0.0	0.0100		

*Source categories footnoted by capital letter belong to the same facility and have been determined to be a minor source after aggregation.

X Uncontrolled Specified Pollutant Emission by Representative Facility Size (Ton/Yr).

Y Facility Size Required for Source Category to Qualify as Major Source (≥100 Ton Pollutant/Yr) for Specified Pollutant (Process Units/Yr).

Table A-2. (Cont'd)

		PP	SO	NO	HC	CO	PB	AM	MS	FL	Representative Facility Size (Process Units/yr)	
		EMISSIONS (TONS/YR) REQUIRED SOURCE SIZE (PROCESS UNITS/YR)										
40 C03	CONCRETE BATCH PLANT										0.2000	
	X→	10.0000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	Y→	2.0000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
40 F02	MICA IND (MINING PART)[b]										0.0079	C*
		47.8200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		0.0167	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
40 F03	MICA IND (DRYING PART)[b]										0.0079	C*
		47.5200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		0.0167	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
50 R02	SECONDARY MAGNESIUM SMELTER										0.0083	
		0.7000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		0.0500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
50 C01	GREY IRON FOUNDRIES (INDUCTION FURNACE)										0.0600	
		45.0000	0.0	0.0	0.0	0.0	1.3000	0.0	0.0	0.0		
		0.1333	0.0	0.0	0.0	0.0	4.0000	0.0	0.0	0.0		
50 D03	STEEL FOUNDRIES (INDUCTION)										0.0100	
		0.3000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
		2.0000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
60 B06	GRAPHIC ARTS INDUSTRY (LITHOGRAPHY)[b]										0.0002	
		0.0	0.0	0.0	93.8996	0.0	0.0	0.0	0.0	0.0		
		0.0	0.0	0.0	0.0003	0.0	0.0	0.0	0.0	0.0		
60 D01	SOLVENT METAL CLEANING (COLD CLEANERS)										0.0008	
		0.0	0.0	0.0	0.3750	0.0	0.0	0.0	0.0	0.0		
		0.0	0.0	0.0	0.1333	0.0	0.0	0.0	0.0	0.0		
60 D02	SOLVENT METAL CLEANING (OPEN TOP VAPOR DEGREASERS)										0.0135	
		0.0	0.0	0.0	11.6250	0.0	0.0	0.0	0.0	0.0		
		0.0	0.0	0.0	0.1333	0.0	0.0	0.0	0.0	0.0		
60 D03	SOLVENT METAL CLEANING (CONVEYORIZED DEGREASING)										0.0440	
		0.0	0.0	0.0	33.0000	0.0	0.0	0.0	0.0	0.0		
		0.0	0.0	0.0	0.1333	0.0	0.0	0.0	0.0	0.0		
60 F05	P.T.M. ID. (GAS. BULK PLANTS)(STORAGE & TRANSFER)										0.1737	
		0.0	0.0	0.0	71.2075	0.0	0.0	0.0	0.0	0.0		
		0.0	0.0	0.0	0.2439	0.0	0.0	0.0	0.0	0.0		
60 F06	P.T.M. ID. (SERVICE STATION LOADING)										0.0083	D*
		0.0	0.0	0.0	1.6458	0.0	0.0	0.0	0.0	0.0		
		0.0	0.0	0.0	0.5063	0.0	0.0	0.0	0.0	0.0		
60 F07	P.T.M. ID. (SERVICE STATION UNLOADING)										0.0083	D*
		0.0	0.0	0.0	1.9874	0.0	0.0	0.0	0.0	0.0		
		0.0	0.0	0.0	0.4193	0.0	0.0	0.0	0.0	0.0		

*Source categories footnoted by capital letter belong to the same facility and have been determined to be a minor source after aggregation.

X - Uncontrolled Specified Pollutant Emission by Representative Facility Size (Ton/Yr).

Y Facility Size Required for Source Category to Qualify as Major Source (≥100 Ton Pollutant/Yr) for Specified Pollutant (Process Units/Yr).

[b] At the time of publication, ANL was informed that there may be new data which will alter the impact analysis of this source category.

Table A-2. (Cont'd)

	PM	SC	NO	HC	CO	PB	AM	HS	FL	Representative Facility Size (Process Units/yr)
	EMISSIONS (TONS/YR) REQUIRED SOURCE SIZE (PROCESS UNITS/YR)									
64 B03 INDUSTRIAL SURFACE COATING (METAL FURNITURE COATING)[b]										0.0198
	X → 0.0	0.0	0.0	49.5088	0.0	0.0	0.0	0.0	0.0	
	Y → 0.0	0.0	0.0	0.0313	0.0	0.0	0.0	0.0	0.0	
65 B02 INDUSTRIAL SURFACE COATING (WOOD FURNITURE COATING)										0.0187
	0.0	0.0	0.0	59.7168	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0313	0.0	0.0	0.0	0.0	0.0	
65 B03 INDUSTRIAL SURFACE COATING (FLATWOOD PRODUCTS)[b]										0.0292
	0.0	0.0	0.0	93.1161	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0313	0.0	0.0	0.0	0.0	0.0	
80 B02 PULPBOARD MFGR.										0.1209
	7.2524	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	1.6667	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
90 B01 LEAD ACID BATTERY										0.6218
	5.4720	0.0	0.0	0.0	0.0	5.4720	9.9491	0.0	0.0	
	11.3636	0.0	0.0	0.0	0.0	11.3636	6.2500	0.0	0.0	
90 C01 CABLE COVER PROC. PLANT										0.0025
	0.0	0.0	0.0	0.0	0.0	0.6250	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.4000	0.0	0.0	0.0	
90 D01 TYPE METAL PRODUCTION PLANT										0.0000
	0.0	0.0	0.0	0.0	0.0	0.8291	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0034	0.0	0.0	0.0	
90 E01 CAN MFG PLANT										0.0006
	0.0	0.0	0.0	0.0	0.0	0.8046	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0	0.0	0.0643	0.0	0.0	0.0	
90 F03 TEXTILE MFG (CARPET MFG)										0.0091
	0.0	0.0	0.0	3.6400	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.2500	0.0	0.0	0.0	0.0	0.0	
90 F04 TEXTILE MFG (TEXTURING)										0.0091
	0.0	0.0	0.0	20.9300	0.0	0.0	0.0	0.0	0.0	
	0.0	0.0	0.0	0.0435	0.0	0.0	0.0	0.0	0.0	

X Uncontrolled Specified Pollutant Emission by Representative Facility Size (Ton/Yr).

Y Facility Size Required for Source Category to Qualify as Major Source (≥100 Ton Pollutant/Yr) for Specified Pollutant (Process Units/Yr).

[b] At the time of publication, ANL was informed that there may be new data which will alter the impact analysis of this source category.

Table A-3. Model IV Major Source: 1980-1990

[FOR EXPLANATION OF TERMS SEE PAGE
A-7, APPENDIX A]

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              TABLE  1

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                  (2)     (3)      (4)    (5)    (6)                (7)
                              EMISSION RATES       GROWTH RATES                                               EMISSIONS
           EMISSION        ALLOWABLE     UNCONT  DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION           1000 TONS/YEAR           TONS/YEAR
RATING K     UNITS          E        E        E      P      P       UNITS        A        B       C        T        T        T       T -T
                            S        N        U      B      C                                             A        S        N       S  N
PARTICULATES

50 C06GREY IRON FOUNDRIES  (CUPOLA)                                 SIZE =    711.4492TONS/YR  ZAVE=    0.0900
    0.930      LB/TON      1.770   0.200   17.000 0.0   -0.018S   E6 TONS   13.44    0.0    -2.42    11.06    9.07   10.64         ✱

20 D01SYNTHETIC RUBBER IND.  (STYRENE-BUTZDIENE)(SBR)               SIZE =    30.5620TONS/YR  ZAVE=    0.1480
    0.590      LB/TON      0.700   0.120    0.700 0.0     0.0  C  E6 TONS    2.37    0.0     0.0      0.49    0.49    0.49         ✱

10 A03INDUSTRIAL BOILERS  (10-250X1066 BTU/HR)                      SIZE =    737.3035TONS/YR  ZAVE=    1.1830
    0.450    LB/E6 BTU     0.404   0.404    2.770 0.033S 0.014C   E12 BTU   20940    6910    3123    1903.   2187.   2187.   .     ✱

42 D08CASTABLE REFRACTORY PLANT  (ELECTRIC ARC)                     SIZE =    60.0000TONS/YR  ZAVE=    0.0030
    0.800      LB/TON      0.800   0.800   50.000 0.033S 0.043C   E6 TONS    0.48    0.16    0.25     0.15    0.23    0.23         ✱ R*

40 A01STONE QUARRYING & PROCESSING                                  SIZE =   3459.9968TONS/YR  ZAVE=    0.5000
    0.800      LB/TON      2.600   2.600   17.300 0.050S 0.033S   E6 TONS   1427     713     471     1484.   1974.   1974.         ✱

40 D10CERAMIC CLAY MFG                                              SIZE =    259.1997TONS/YR  ZAVE=    0.0036
    0.800      LB/TON     18.000  18.000  180.000 0.033S 0.042S   E6 TONS   13.40    4.42    5.63    96.48  137.00  137.00         ✱

44 D08CASTABLE REFRACTORY PLANT  (CRUSHING/PROCESS)                 SIZE =    144.0000TONS/YR  ZAVE=    0.0030
    0.800      LB/TON      7.000   7.000  120.000 0.033S 0.043C   E6 TONS    0.48    0.16    0.25     1.34    2.04    2.04         ✱ F*

40 D06FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)                  SIZE =    82.6559TONS/YR  ZAVE=    0.0410
    0.840      LB/TON      4.400   4.400    4.800 0.030S 0.067C   E6 TONS    0.46    0.14    0.42     0.85    1.63    1.63         ✱

40 D14FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)                     SIZE =   1728.5593TONS/YR  ZAVE=    0.0410
    0.850      LB/TON      9.300   9.300   99.200 0.030S 0.075C   E6 TONS    1.47    0.44    1.56     8.81   11.97   11.97         ✱

20 C48ACETIC ANHYDRIDE                                              SIZE =     0.4380TONS/YR  ZAVE=    0.1095
    0.800      LB/TON      0.010   0.001    0.010 0.030S 0.060C   E6 TONS    1.26    0.38    1.00     0.01    0.01    0.00         5.

50 E06SECONDARY ZINC SMELTERS  (CALCINING KILNS)                    SIZE =    15.7850TONS/YR  ZAVE=    0.0077
    0.820      LB/TON      2.710   0.180    5.000 0.035S 0.018C   E6 TONS    0.03    0.01    0.01     0.03    0.04    0.02        23. E F*

50 E05SECONDARY ZINC SMELTERS  (GALVINIZING)                        SIZE =    15.7850TONS/YR  ZAVE=    0.0077
    0.820      LB/TON      2.710   0.180    5.000 0.033S 0.018C   E6 TONS    0.03    0.01    0.01     0.03    0.04    0.02        23. E F*

50 B16SECONDARY ALUMINUM PLANT  (CRUCIBLE FURNACE)                  SIZE =    10.3360TONS/YR  ZAVE=    0.0160
    0.880      LB/TON      1.900   0.0      1.900 0.036S 0.025S   E6 TONS    0.14    0.05    0.03     0.09    0.11    0.06        63. B*

51 B01SECONDARY COPPER PLANT  (SWEATING)                            SIZE =    516.5994TONS/YR  ZAVE=    0.0190
    0.820      LB/TON      3.470   0.280   70.000 0.035S 0.014C   E6 TONS    0.10    0.03    0.01     0.14    0.16    0.09        63. B F*

50 E02SECONDARY ZINC SMELTERS  (HORIZONTAL MUFFLE)                  SIZE =    142.0649TONS/YR  ZAVE=    0.0077
    0.820      LB/TON      2.710   1.670   45.000 0.033S 0.018C   E6 TONS    0.27    0.09    0.05     0.30    0.36    0.30        63. F*
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*Source categories footnoted by capital letter belong to the same facility and have been aggregated for analysis purposes.

✱Source categories indicate small potential emission reduction or decreasing capacity.

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Table A-3. (Cont'd)

TABLE 1

NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED

POLLUTANT/SOURCE (1) RATING K	EMISSION UNITS	(2) EMISSION RATES ALLOWABLE E_S	(3) E_N	(4) UNCONT E_U	(5) GROWTH RATES DECIMAL/YEAR P_B	(6) P_C	(7) INDUSTRY CAPACITY/PRODUCTION UNITS	A	B	C	EMISSIONS 1000 TONS/YEAR T_A	T_S	T_N	TONS/YEAR $T_S - T_N$	
PARTICULATES															
50 E01SECONDARY ZINC SMELTERS (RETORT FURNACE)							SIZE =	148.3790TONS/YR		ZAVE=	0.0077				
0.820	LB/TON	2.710	1.740	47.000	0.0335	0.018C	E6 TONS	0.27	0.39	0.05	0.30	0.36	0.30	60.	E*
20 C45STYRENE							SIZE =	6.0840TONS/YR		ZAVE=	0.3390				
0.900	LB/TON	0.040	0.004	0.040	0.0405	0.055C	E6 TONS	3.67	1.47	2.60	0.07	0.11	0.09	70.	
50 E04SECONDARY ZINC SMELTERS (REVERBERATORY SWEAT FURNACES)							SIZE =	69.4539TONS/YR		ZAVE=	0.0077				
0.820	LB/TON	2.710	0.810	22.000	0.0335	0.018C	E6 TONS	0.30	0.10	0.06	0.33	0.40	0.28	120.	F*
50 E03SECONDARY ZINC SMELTERS (KETTLE FURNACE)							SIZE =	56.8260TONS/YR		ZAVE=	0.0077				
0.820	LB/TON	2.710	0.670	18.000	0.0335	0.018C	E6 TONS	0.30	0.10	0.06	0.33	0.40	0.27	130.	E*
30 D10ANIMAL FEED DEFLUORINATION							SIZE =	14062.4883TONS/YR		ZAVE=	0.0500				
0.900	LB/TON	4.570	0.063	625.000	0.0405	0.0 S	E6 TONS	0.20	0.08	0.0	0.41	0.41	0.23	160.	
41 D09BRICK & RELATED CLAY PRODUCTS (DRYER/GRINDER)							SIZE =	959.9993TONS/YR		ZAVE=	0.0250				B I J*
0.800	LB/TON	2.770	0.960	96.000	0.0335	0.0275	E6 TONS	0.41	0.13	0.11	0.45	0.57	0.40	180.	E L G*
44 D10PERIODIC KILN (GAS FIRED)							SIZE =	1.1000TONS/YR		ZAVE=	0.0250				
0.800	LB/TON	0.110	0.0	0.110	0.0335	0.0275	E6 TONS	7.56	2.49	2.04	0.33	0.42	0.22	200.	E*
43 D10CURING & FIRING (TUNNEL KILNS-GAS FIRED)							SIZE =	0.4000TONS/YR		ZAVE=	0.0250				
0.800	LB/TON	0.040	0.0	0.040	0.0335	0.0275	E6 TONS	22.94	7.57	6.19	0.37	0.47	0.25	220.	G*
54 B01SECONDARY COPPER PLANT (IND. FURNACE)							SIZE =	14.7600TONS/YR		ZAVE=	0.0180				
0.820	LB/TON	2.000	0.008	2.000	0.0355	0.014C	E6 TONS	0.56	0.20	0.08	0.46	0.53	0.30	230.	B C*
42 D09BRICK & RELATED CLAY PRODUCTS (STORAGE)							SIZE =	339.9998TONS/YR		ZAVE=	0.0250				B I J*
0.800	LB/TON	2.770	0.340	34.000	0.0335	0.0275	E6 TONS	0.41	0.13	0.11	0.45	0.57	0.34	240.	E L G*
52 B01SECONDARY COPPER PLANT (BLAST)							SIZE =	132.8400TONS/YR		ZAVE=	0.0180				
0.820	LB/TON	3.470	0.072	18.000	0.0355	0.014C	E6 TONS	0.40	0.14	0.06	0.57	0.65	0.38	280.	F*
40 D19GLASS MANUFACTURING INDUSTRY (LEAD GLASS)							SIZE =	55.0799TONS/YR		ZAVE=	0.0041				
0.900	LB/TON	1.890	0.240	24.000	0.0335	0.0355	E6 TONS	0.65	0.21	0.23	0.55	0.75	0.42	330.	
58 B01SECONDARY COPPER PLANT (REVERBERATOR)							SIZE =	73.8000TONS/YR		ZAVE=	0.0180				
0.820	LB/TON	3.470	0.040	10.000	0.0355	0.014C	E6 TONS	0.48	0.17	0.07	0.68	0.78	0.45	340.	B C*
44 D12PERIODIC KILN (COAL FIRED)							SIZE =	32.0000TONS/YR		ZAVE=	0.0250				
0.800	LB/TON	2.770	0.030	3.200	0.0335	0.0275	E6 TONS	0.51	0.17	0.14	0.57	0.72	0.38	340.	G*
53 B01SECONDARY COPPER PLANT (CONVERTER)							SIZE =	442.7998TONS/YR		ZAVE=	0.0180				
0.820	LB/TON	3.470	0.240	80.000	0.0355	0.014C	E6 TONS	0.56	0.20	0.08	0.80	0.92	0.55	370.	C*

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Table A-3. (Cont'd)

```
          TABLE  1

   NOTE: 1 IN RATING CCLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                     (2)      (3)      (4)   (5)    (6)                (7)
                               EMISSION RATES        GROWTH RATES                                                      EMISSIONS
             EMISSION         ALLOWABLE    UNCONT    DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION             1000 TONS/YEAR               TONS/YEAR
RATING K      UNITS           E        E       E      P      P       UNITS          A        B        C           T          T          T       T -T
                              S        N       U      B      C                                               A          S          N        S  N
PARTICULATES

80 A04CHEMICAL WOOD PULPING IND.  (ACID SULFITE)                           SIZE =    700.1270TONS/YR  ZAVE=    0.0884
    0.460      LB/TON      3.000   2.000   24.000 0.0315 0.0  C   E6 TONS       3.78     1.17     0.0         3.74      3.74      3.30      790.

47 F03FLUORSPAR  (DRYER)                                                   SIZE =     12.9280TONS/YR  ZAVE=    0.0162
    0.800      LB/TON      2.300   0.020    2.000 0.0305 0.044C   E6 TONS       0.50     0.25     0.27        0.40      0.62      0.20      410.  H*

47 F04FLUORSPAR  (CRUSH & SCREEN)                                          SIZE =     12.9280TONS/YR  ZAVE=    0.0162
    0.800      LB/TON      2.000   0.020    2.000 0.0305 0.044C   E6 TONS       0.50     0.25     0.27        0.40      0.62      0.20      410.  H*

45 F02BORON COMPOUNDS  (MINING)                                            SIZE =    104.4000TONS/YR  ZAVE=    0.2610
    0.800      LB/TON      1.000   0.500    1.000 0.0505 0.047C   E6 TONS       1.97     0.99     1.15        0.79      1.25      0.62      430.  I*

44 D11PERIODIC KILN (OIL FIRED)                                            SIZE =      9.0000TONS/YR  ZAVE=    0.0250
    0.800      LB/TON      0.900   0.0      0.900 0.0335 0.0275   E6 TONS       2.04     0.67     0.55        0.73      0.43      0.49      440.  I*

41 D16CLAY & FLY-ASH SINTERING  (CLAY-SINTERING)                           SIZE =   1910.9980TONS/YR  ZAVE=    0.1837
    0.800      LB/TON      2.410   0.260   26.000 0.0335 0.0275   E6 TONS       1.05     0.35     0.28        1.01      1.29      0.74      540.S*

20 C16CHARCOAL PLANTS                                                      SIZE =    310.2495TONS/YR  ZAVE=    0.0018
    0.850      LB/TON     19.500   4.300  400.000 0.0235 0.0255   E6 TONS       0.17     0.04     0.04        1.41      1.76      1.22      540.

42 D16CLAY & FLY-ASH SINTERING  (CLAY-CRUSHING)                            SIZE =    992.2493TONS/YR  ZAVE=    0.1837
    0.800      LB/TON      2.410   0.140   13.500 0.0335 0.0275   E6 TONS       1.05     0.35     0.28        1.01      1.29      0.71      570.  S*

20 C10DETERGENT MANUFACTURING PLANTS                                       SIZE =    157.5449TONS/YR  ZAVE=    0.0039
    0.900      LB/TON      1.500   2.450   90.000 0.0    0.035C   E6 TONS       2.97     0.0      1.22        2.00      2.63      2.25      580.

50 A12SECONDARY ALUMINUM PLANT  (SWEATING FURNACE)                         SIZE =     78.8800TONS/YR  ZAVE=    0.0160
    0.680      LB/TON      7.360   3.300   14.500 0.0365 0.0255   E6 TONS       0.70     0.25     0.18        1.75      2.19      1.60      590.  B*

50 A13SECONDARY ALUMINUM PLANT  (REVERBATORY FURNACE)                      SIZE =     28.2080TONS/YR  ZAVE=    0.0160
    0.820      LB/TON      4.300   1.300    4.300 0.0365 0.0255   E6 TONS       0.81     0.29     0.20        1.44      1.79      1.18      610.  B*

40 B02ASPHALT ROOFING  (BLOWING)                                           SIZE =    337.9995TONS/YR  ZAVE=    0.0325
    0.800      LB/TON      1.180   0.860   26.000 0.0425 0.0455   E6 TONS       6.47     2.72     2.91        3.05      4.43      3.71      720.  F*

40 D03PHOSPHATE ROCK  (CALCINING)                                          SIZE =   2399.9980TONS/YR  ZAVE=    0.2000
    0.850      LB/TON      3.630   0.400   40.000 0.0505 0.0605   E6 TONS       7.00     3.50     4.20        1.87      3.00      2.25      750.  T*

20 C18EXPLOSIVE IND (LOW EXPLOSIVES)                                       SIZE =     81.8463TONS/YR  ZAVE=    0.0104
    0.830      LB/TON      1.550   0.380   19.000 0.0455 0.094C   E6 TONS       0.81     0.36     1.18        0.52      1.28      0.53      750.

20 A10PHOSPHORIC  ACID PLANTS  (THERMAL PROCESS)                           SIZE =   1917.3982TONS/YR  ZAVE=    0.0353
    0.810      LB/TON      2.270   0.134  134.000 0.0455 0.014C   E6 TONS       1.49     0.67     0.23        1.37      1.88      0.60      780.
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Table A-3. (Cont'd)

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          TABLE  1

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                 (2)     (3)      (4)   (5)    (6)                    (7)
                          EMISSION RATES       GROWTH RATES                                                            EMISSIONS
             EMISSION     ALLOWABLE    UNCONT  DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION              1000 TONS/YEAR                TONS/YEAR
RATING K      UNITS       E         E        E     P      P     UNITS         A        B        C          T          T           T          T -T
                          S         N        U     B      C                                         A          S           N          S  U
PARTICULATES

11 C01STATIONARY PIPELINE COMPRESSOR ENGINES                        SIZE =     2.1240TONS/YR  ZAVE=    0.0040
   0.900    LB/PRD UNT   1.180   0.830    1.180 0.0205 0.0735   E6 PU      3.55     1.11     4.05      2.95      5.10       4.29       910.

41 D06CASTABLE REFRACTORY PLANT  (RAW MTRL DRYER)                   SIZE =    35.9999TONS/YR  ZAVE=    0.0030
   0.800      LB/TON     5.320   0.300   35.000 0.0335 0.0430   E6 TONS    0.48     0.16     0.25      1.02      1.55       0.78       920. E*

43 D08CASTABLE REFRACTORY PLANT (MOLDING-SHALE)                     SIZE =    30.0000TONS/YR  ZAVE=    0.0030
   0.800      LB/TON     5.320   0.300   25.000 0.0335 0.0430   E6 TONS    0.48     0.16     0.25      1.02      1.55       0.78       920. E*

40 D12PERLITE  (VERTICAL FURNACE)                                   SIZE =    54.5873TONS/YR  ZAVE=    0.0063
   0.820      LB/TON     4.350   0.210   21.000 0.0295 0.0365   E6 TONS    0.76     0.22     0.27      1.36      1.45       1.03       950.

43 D11CURING & FIRING  (TUNNEL KILNS-OIL FIRED)                     SIZE =     6.0000TONS/YR  ZAVE=    0.0250
   0.800      LB/TON     0.600   0.0      0.600 0.0335 0.0275   E6 TONS    6.12     2.02     1.08      1.47      1.87       0.98       980. I*

43 D12CURING & FIRING  (TUNNEL KILNS-COAL FIRED)                    SIZE =    20.0000TONS/YR  ZAVE=    0.0250
   0.800      LB/TON     2.000   0.0      2.000 0.0335 0.0275   E6 TONS    2.04     0.67     0.55      1.63      2.07       1.69       990. J*

10 C02STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)    SIZE =     3.6065TONS/YR  ZAVE=    0.0023
   0.580      LB/TON     5.410   5.140    5.410 0.0335 0.0285   E6 TONS   20.52     6.77     5.75     32.19     41.21      40.23       990.

20 R09SYNTHETIC FIBER INDUSTRY  (NYLON)                             SIZE =   239.9999TONS/YR  ZAVE=    0.0400
   0.800      LB/TON     1.530   7.750   15.000 0.0455 0.0890   E6 TONS    1.84     0.83     2.48      1.13      2.04       1.01      1130.

20 R04POLYETHYLENE (LOW DENSITY)                                    SIZE =    28.2898TONS/YR  ZAVE=    0.1450
   0.867      LB/GAL     0.450   0.045    0.450 0.0065 0.0820   E6 GAL     4.61     0.28     5.53      0.90      1.38       0.96      1190.

12 E04INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)       SIZE =   520.9919TONS/YR  ZAVE=    0.0107
   0.900      LB/TON     6.470   5.400  108.000 0.0355 0.1285   E6 TONS    1.54     0.54     1.07      4.47     10.20       8.99      1190.

40 D13MINERAL WOOL MFG.                                             SIZE =  1032.1653TONS/YR  ZAVE=    0.0777
   0.820      LB/TON     4.270   3.830   32.400 0.0295 0.0205   E6 TONS    9.24     2.68     1.85     16.18     19.41      18.22      1230.

20 C03CARBON BLACK  (FURNACE PROCESS)                               SIZE =  5165.9922TONS/YR  ZAVE=    0.0630
   0.820      LB/TON     3.100   1.100  200.000 0.0455 0.0230   E6 TONS    2.36     1.08     0.66      3.00      3.14       2.43      1410.

47 F02FLUORSPAR  (MINING)                                           SIZE =    77.5679TONS/YR  ZAVE=    0.0162
   0.800      LB/TON    12.000   6.000   12.000 0.0500 0.0440   E6 TONS    0.50     0.32     0.27      2.40      3.71       2.30      1430. H*

30 D01ALFALFA DEHYDRATING PLANTS                                    SIZE =   368.3958TONS/YR  ZAVE=    0.0624
   0.300      LB/TON     2.060   0.236   23.600 0.0295 0.0330   E6 TONS    4.84     1.40     1.99      2.49      3.52       1.97      1500.

40 B01ASPHALT ROOFING  (SATURATOR)                                  SIZE =    10.4000TONS/YR  ZAVE=    0.0325
   0.800      LB/TON     0.800   0.100    0.800 0.0425 0.0455   E6 TONS    6.47     2.72     2.01      2.07      3.30       1.48      1600. G*
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Table A-3. (Cont'd)

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              TABLE  1

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                       (2)      (3)       (4)     (5)     (6)                (7)
                                 EMISSION RATES          GROWTH RATES                                                                EMISSIONS
           EMISSION           ALLOWABLE     UNCONT     DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION                         1000 TONS/YEAR              TONS/YEAR
RATING K     UNITS               E          E          E        P       P        UNITS        A        B        C              T        T         T        T -T
                                 S          M          U        B       C                                                  A        S         U         S  M
PARTICULATES

20 C28PHTHALIC ANHYDRIDE PLANTS  (NAPTHALENE PROCESS)                        SIZE =   3092.0662TONS/YR  ZAVE=   0.0690
    0.948       LB/TON      99.000    0.990   99.000 0.020S 0.0  S   E6 TONS     0.19     0.04     0.9      6.92     6.92      7.15     1800.

20 A17HYDROGEN FLUORIDE                                                      SIZE =    254.0159TONS/YR  ZAVE=   0.0441
    0.800       LB/TON      14.400    1.010   14.400 0.030S 0.035C   E6 TONS     0.50     0.15     0.21     2.93     4.39      2.17     1900.

20 A15BORAX BORIC ACID                                                       SIZE =   1989.3982TONS/YR  ZAVE=   0.1750
    0.980       LB/TON      23.200    1.020   23.200 0.030S 0.040C   E6 TONS     0.25     0.07     0.12     2.86     4.21      2.16     2100.

20 B08DACRON POLY.                                                           SIZE =    107.6250TONS/YR  ZAVE=   0.0410
    0.750       LB/TON       1.580    0.350    7.000 0.045S 0.100C   E6 TONS     2.35     1.15     4.06     1.51     3.92      1.51     2600.

30 D18STARCH MFGR                                                            SIZE =    179.2799TONS/YR  ZAVE=   0.0540
    0.830       LB/TON       2.000    0.020    8.000 0.045S 0.018C   E6 TONS     4.65     2.39     0.91     3.06     4.01      2.19     2900.

20 C17EXPLOSIVE IND (HIGH EXPLOSIVES)                                        SIZE =    396.4241TONS/YR  ZAVE=   0.0367
    0.830       LB/TON       1.550    0.260   26.000 0.045S 0.090C   E6 TONS     2.88     1.30     3.96     1.85     4.89      1.59     3000.

45 D08CASTABLE REFRACTORY PLANT (CURING)                                     SIZE =      0.2400TONS/YR  ZAVE=   0.0030
    0.800       LB/TON      20.200    0.0      0.280 0.033S 0.043C   E6 TONS     0.48     0.16     0.25     3.80     5.18      2.59     3300. H*

45 F05LIME IND (CRUSHING)                                                    SIZE =     66.9600TONS/YR  ZAVE=   0.2700
    0.800       LB/TON       0.620    0.310    0.620 0.030C 0.050S   E6 TONS    35.49    12.21    17.76     6.80    13.20      9.49     3700. H*

30 A05NITRATE FERTILIZER  (AMMONIUM NITRATE) PLANTS                          SIZE =    708.4016TONS/YR  ZAVE=   0.1224
    0.910       LB/TON       1.640    0.180   12.720 0.045S 0.020S   E6 TONS     8.83     3.07     1.77     6.59     7.71      4.09     3800.

30 C03GREY IRON FOUNDRIES  (REVERBERATORY)                                   SIZE =    278.9998TONS/YR  ZAVE=   0.0600
    0.930       LB/TON      10.000    0.100   10.000 0.028S 0.130S   E6 TONS     0.36     0.15     0.73     2.51     5.93      1.03     4100.

20 B19POLYESTER RESIN                                                        SIZE =     57.1199TONS/YR  ZAVE=   0.0240
    0.680       LB/TON       7.000    0.350    7.000 0.045S 0.100C   E6 TONS     1.00     0.65     1.59     2.38     5.17      1.53     4600.

50 F01URANINUM REFINING                                                      SIZE =     49.3000TONS/YR  ZAVE=   0.1160
    0.850       LB/TON       1.000    0.010    1.000 0.028S 0.012S   E6 TONS    27.90     7.81     3.35    11.05    13.28      6.59     4700.

45 F03BORON COMPOUNDS  (CRUSHING)                                            SIZE =    826.3996TONS/YR  ZAVE=   0.2610
    0.800       LB/TON       6.000    0.060    6.000 0.050S 0.047C   E6 TONS     1.97     0.99     1.15     4.74     7.50      2.42     5100. I*

45 F04BORON COMPOUNDS  (MIX & FILTRATION)                                    SIZE =    730.7993TONS/YR  ZAVE=   0.2610
    0.800       LB/TON       7.000    0.300    7.000 0.050S 0.047C   E6 TONS     1.97     0.99     1.15     5.53     8.75      3.19     5600. I*

50 D02STEEL FOUNDRIES  (OPEN HEARTH)                                         SIZE =    465.4998TONS/YR  ZAVE=   0.0900
    0.900       LB/TON       2.200    0.220   11.000 0.028S 0.073S   E6 TONS     6.29     1.76     6.59     6.23    10.77      5.11     5700.
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Table A-3. (Cont'd)

```
          TABLE  1

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                    (2)     (3)      (4)    (5)    (6)                     (7)
                              EMISSION RATES        GROWTH RATES                                                   EMISSIONS
              EMISSION       ALLOWABLE   UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION               1000 TONS/YEAR          TONS/YEAR
RATING K       UNITS         E       E        E       P      P       UNITS          A       B       C          T       T        T      T -T
                             S       N        U       B      C                                           A       S        N        S  P
PARTICULATES

30 B01COTTON GINNING                                                SIZE =    81.6000TONS/YR  ZAVE=    0.0136
    1.000    LB/BALE       2.090   3.480   12.000 0.042S 0.013S   E6 BALE    13.52    5.68    1.76    14.13   15.97    9.96    6000.

20 B07POLYPROPLYENE                                                 SIZE =   118.1698TONS/YR  ZAVE=    0.1010
    0.780    LB/TON        2.670   0.030    3.000 0.003S 0.120C   E6 TONS     2.75    0.08    5.79     2.86    8.89    2.85    6000.

20 B21UREA                                                          SIZE =   191.2159TONS/YR  ZAVE=    0.0760
    0.740    LB/TON        6.800   1.360    6.800 0.030S 0.030C   E6 TONS     5.87    1.76    2.02    14.77   19.65   12.24    7600.

10 A07MIXED FUEL BOILERS  (OIL & REFUSE)                            SIZE =   399.9990TONS/YR  ZAVE=    0.1200
    0.500    LB/TON        5.000   0.200   20.000 0.039S 0.046S   E6 TONS     7.50    2.92    3.45     9.37   13.69    6.04    7600.

55 A01PESTICIDES MANUFACTURING                                      SIZE =   209.5749TONS/YR  ZAVE=    0.0500
    0.830    LB/TON       10.000   0.100   10.100 0.045S 0.070C   E6 TONS     1.30    0.58    1.26     5.39   10.61    3.04    7600.

10 A06MIXED FUEL BOILERS  (COAL & REFUSE)                           SIZE =   917.9990TONS/YR  ZAVE=    0.1200
    0.510    LB/TON        5.000   0.300   30.000 0.039S 0.046S   E6 TONS     7.50    2.92    3.45     9.56   13.96    6.32    7600.

40 D11GYPSUM MANUFACTURING PLANTS  (CALCINER)                       SIZE =  4533.1953TONS/YR  ZAVE=    0.1287
    0.800    LB/TON        1.510   0.100   90.000 0.029S 0.049S   E6 TONS    18.72    5.50    9.17    11.31   16.85    8.57    8300.

20 C24SODIUM CARBONATE PLANT  (NATURAL PROCESS)                     SIZE = 22534.7266TONS/YR  ZAVE=    0.5756
    0.870    LB/TON        1.160   0.450   90.000 0.045S 0.128C   E6 TONS     9.78    4.40   22.84     4.93   16.46    8.05    8400.

20 C26PHTHALIC ANHYDRIDE PLANTS (O-XYLENE PROCESS)                  SIZE =  7398.9453TONS/YR  ZAVE=    0.0650
    0.948    LB/TON       24.000   2.400  240.000 0.020S 0.090C   E6 TONS     0.61    0.12    0.94     6.96   16.48    6.06    9800.

45 E01METALLIC MINERALS MINING  (ZINC MINE & CRUSHING)              SIZE =    94.5000TONS/YR  ZAVE=    0.0300
    0.900    LB/TON        7.000   0.700    7.000 0.028S 0.012S   E6 TONS     8.92    2.50    1.07    23.10   31.47   21.35   10100.

30 D09BEER PROCESSING PLANTS                                        SIZE =    95.1545TONS/YR  ZAVE=    0.0431
    0.810  LB/PRD UNT      2.090   0.270    5.450 0.040S 0.070C   E6 PU      10.10    4.04    9.77     9.55   16.62    6.64   10200.

44 E01METALIC MINERALS MINING (LEAD MINING)                         SIZE =    94.5000TONS/YR  ZAVE=    0.0300
    0.900    LB/TON        7.000   0.700    7.000 0.028S 0.013S   E6 TONS     9.26    2.59    1.20    29.17   32.96   22.20   10800.

10 B03MUNICIPAL INCINERATION < 50T/D                                SIZE =    52.4999TONS/YR  ZAVE=    0.0062
    0.560    LB/TON        6.470   0.300   30.000 0.039S 0.046S   E6 TONS     7.50    2.92    3.45    13.59   19.64    8.82   11000.

40 D01PHOSPHATE ROCK  (GRINDING)                                    SIZE =  1699.9978TONS/YR  ZAVE=    0.2000
    0.850    LB/TON        0.940   0.600   20.000 0.050S 0.060S   E6 TONS    70.40   35.20   42.24    28.12   45.00   33.81   11200.T*

40 D07GLASS MANUFACTURING INDUSTRY  (SODA-LIME GLASS)               SIZE =    52.1485TONS/YR  ZAVE=    0.0524
    0.900    LB/TON        1.890   0.022    2.210 0.033S 0.034S   E6 TONS    20.23    6.68    6.88    17.21   23.06   11.66   11400.
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Table A-3. (Cont'd)

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          TABLE  1

   NOTE: 1 IN RATING CCLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                    (2)     (3)      (4)    (5)    (6)                 (7)
                              EMISSION RATES       GROWTH RATES                                                        EMISSIONS
            EMISSION         ALLCWABLE    UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION              1000 TONS/YEAR               TONS/YEAR
RATING K     UNITS           E        E        E      P      P      UNITS          A        B        C           T        T         T        T -T
                             S        N        U      B      C                                                A        S         N        S  N
PARTICULATES

42 E01METALIC MINERALS MINING (FERROALLOY)                              SIZE =    190.2599TONS/YR  ZAVE=    0.0280
    0.900       LB/TON    15.100   0.600   15.100 0.028C 0.015S   E6 TONS       3.73     1.19     0.56     25.35   29.15    17.76    11400.

46 E01METALLIC MINERALS MINING  (ALUMINUM)                              SIZE =    149.8409TONS/YR  ZAVE=    0.0300
    0.900       LB/TON    11.100   0.110   11.100 0.028S 0.045S   E6 TONS       3.40     0.95     1.53     16.98   24.63    12.35    12300.

20 A18POTASH                                                            SIZE =   2207.4558TONS/YR  ZAVE=    0.6000
    0.777       LB/TON     9.470   0.660    9.470 0.020S 0.030C   E6 TONS       6.82     1.36     2.35     25.09   33.72    21.02    12700.

30 D11VEGETABLE OIL MFG.                                                SIZE =   1036.0143TONS/YR  ZAVE=    0.0358
    0.920       LB/TON     8.630   0.630   63.000 0.028S 0.027S   E6 TONS       7.40     2.07     2.00     29.38   37.31    22.33    15000.

40 D17FLY-ASH SINTERING  (SINTERING)                                    SIZE =  84566.9375TONS/YR  ZAVE=    1.7900
    0.860       LB/TON     4.000   1.100  110.000 0.033S 0.055C   E6 TONS      11.67     3.85     8.26     20.07   34.29    19.18    15100.

41 E01METALLIC MINERALS MINING  (IRON ORE)                              SIZE =    683.5493TONS/YR  ZAVE=    2.1700
    0.900       LB/TON     0.700   0.500    0.700 0.028S 0.029S   E6 TONS     298.90    83.69    86.68     94.15  121.40   106.12    15300.

50 D01STEEL FOUNDRIES  (ELECTRIC ARC)                                   SIZE =    175.4999TONS/YR  ZAVE=    0.0300
    0.900       LB/TON     2.200   0.260   13.000 0.028S 0.073S   E6 TONS      18.86     5.28    13.77     18.67   32.30    15.67    16600.

30 D20AMMONIUM SULFATE                                                  SIZE =   1234.7981TONS/YR  ZAVE=    0.1470
    0.840       LB/TON     2.040   1.000   20.000 0.045S 0.116C   E6 TONS      16.00     7.20    31.95     13.71   41.08    23.98    17100.

30 D08WHISKEY                                                           SIZE =    214.9697TONS/YR  ZAVE=   10.3800
    0.950       LB/GAL     0.028   0.002    0.044 0.032S 0.060S   E6 GAL      1633      523      980        22.     35.      16.     18400.

50 B17SECONDARY ALUMINUM PLANT  (CHLORINATION STATION)                  SIZE =    655.9995TONS/YR  ZAVE=    0.0160
    0.820       LB/TON   100.000   1.000  100.000 0.036S 0.023S   E6 TONS       0.81     0.29     0.20     33.37   41.72    21.56    20200. B*

32 E01FEED & GRAIN MILL  (DRYING)                                       SIZE =      7.7265TONS/YR  ZAVE=    0.0029
    0.820       LB/TON     2.060   0.065    6.500 0.037S 0.015C   E6 TONS      51.60    19.09     8.28     43.58   50.58    28.19    22400. A*

42 F02GYPSUM IND (MINING)                                               SIZE =    752.7158TONS/YR  ZAVE=    0.1944
    0.800       LB/TON     9.680   4.840    9.680 0.050S 0.031C   E6 TONS      17.14     8.57     6.12     66.37   90.06    61.62    28400. Y*

50 C02GREY IRON FOUNDRIES  (ELECTRIC ARC)                               SIZE =    292.9497TONS/YR  ZAVE=    0.0900
    0.930       LB/TON     7.000   0.070    7.000 0.028S 0.136S   E6 TONS       6.18     1.73     8.40     20.12   47.47    14.81    32700.

42 F03GYPSUM IND (CRUSHING)                                             SIZE =    466.5596TONS/YR  ZAVE=    0.1944
    0.800       LB/TON     6.000   0.040    6.000 0.050S 0.031C   E6 TONS      17.14     8.57     6.12     41.14   55.82    20.60    35000. Y*

80 B01PLYWOOD MANUFACTURING PLANT                                       SIZE =   9083.4609TONS/YR  ZAVE=  151.2400
    0.910       LB/TON     0.004   0.001    0.132 0.050S 0.046C   E6 TONS     32282    16141    18333        59.     92.      50.     42000.
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✱Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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          TABLE  1

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                   (2)    (3)     (4)    (5)    (6)                  (7)
                            EMISSION RATES     GROWTH RATES                                                   EMISSIONS
             EMISSION      ALLOWABLE   UNCONT  DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION          1000 TONS/YEAR          TONS/YEAR
RATING K       UNITS        E      E      E      P      P      UNITS       A       B      C       T       T       T       T -T
                            S      N      U      B      C                                   A       S       N        S  N
PARTICULATES

40 D02PHOSPHATE ROCK  (DRYING)                                  SIZE =   1274.9993TONS/YR  ZAVE=   0.2000
    0.850     LB/TON     2.090  0.750   15.000 0.0505 0.0605   E6 TONS     70.40   35.20   42.24   62.53 100.05   55.95   44100.T*

47 E01METALIC MINERALS MINING (URANIMUN)                        SIZE =   3024.9995TONS/YR  ZAVE=   1.0000
    0.550     LB/TON    11.000  0.110   11.000 0.0285 0.1005   E6 TONS     15.46    4.33   15.46   40.77  93.53   34.27   35300.

41 D02PHOSPHATE ROCK  (TRANSFER & STORAGE)                      SIZE =    170.0000TONS/YR  ZAVE=   0.2000
    0.850     LB/TON     2.000  0.0      2.000 0.0505 0.0605   E6 TONS     70.40   35.20   42.24   59.84  95.74   29.92   65800. T*

50 A10BY-PRODUCT COKE OVEN                                      SIZE =   1673.9995TONS/YR  ZAVE=   0.7200
    0.930     LB/TON     5.000  0.215    5.000 0.0285 0.0105   E6 TONS     79.27   22.20    7.93  184.30 202.73  135.71   67000.

43 F02LIME IND (MINING)                                         SIZE =   1295.9993TONS/YR  ZAVE=   0.2700
    0.800     LB/TON    12.000  6.000   12.000 0.0300 0.0505   E6 TONS     35.49   12.21   17.74  170.35 255.53  183.65   71900. W*

43 E01METALIC MINERALS MINING (COPPER)                          SIZE =   3017.4993TONS/YR  ZAVE=   1.0000
    0.850     LB/TON     7.100  0.070    7.100 0.0280 0.0705   E6 TONS     30.10    9.57   21.07   90.83 154.41   62.85   91600.

31 E01FEED & GRAIN MILL  (MILLING)                              SIZE =    106.2719TONS/YR  ZAVE=   0.0144
    0.820     LB/TON     2.360  0.180   18.000 0.0385 0.0150   E6 TONS    258.12   98.09   41.44  218.01 253.01  145.46  108000. A*

41 F03CLAY IND (CRUSH/SCREEN)                                   SIZE =  11842.3125TONS/YR  ZAVE=   0.5586
    0.800     LB/TON    53.000 18.520   53.000 0.0505 0.0380   E6 TONS     10.00    5.00    4.52  212.04 307.89  176.56  131000.U*

11 B04INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)          SIZE =     20.8981TONS/YR  ZAVE=   0.0170
    0.380     LB/TON     6.470  0.065    6.470 0.0395 0.1100   E6 TONS     50.50   19.69   92.89   62.08 176.27   39.26  137000.

42 F04GYPSUM IND (DRYING)                                       SIZE =   1842.9102TONS/YR  ZAVE=   0.1944
    0.800     LB/TON    23.700  0.200   23.700 0.0505 0.0310   E6 TONS     17.14    8.57    6.12  162.49 220.50   82.42  138000.V*

40 A02SAND & GRAVEL PROCESS                                     SIZE =    151.9999TONS/YR  ZAVE=   0.2000
    0.800     LB/TON     1.900  0.420    1.900 0.0505 0.0     E6 TONS      1142     571       0    868.   868.    530.  338000.

44 F01PHOSPHATE ROCK (MINING)                                   SIZE =  24863.9844TONS/YR  ZAVE=   5.1800
    0.800     LB/TON    12.000  6.000   12.000 0.0505 0.0445   E6 TONS    228.40  114.20  100.50 1096.32 1578.70 1063.43  515000.

41 F02CLAY IND (MINING)                                         SIZE =   7596.9531TONS/YR  ZAVE=   0.5586
    0.800     LB/TON    34.000 17.000   34.000 0.0505 0.0380   E6 TONS    100.02   50.01   45.21 1360.27 1975.13 1327.63  647000.U*
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Table A-3. (Cont'd)

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          TABLE  2

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                     (2)     (3)     (4)    (5)    (6)                      (7)
                             EMISSION RATES        GROWTH RATES                                                       EMISSIONS
          EMISSION           ALLOWABLE    UNCONT   DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION          1000 TONS/YEAR          TONS/YEAR
RATING K   UNITS            E       E        E      P      P       UNITS       A       B       C          T          T         T         T -T
                            S       N        U      B      C                                              A          S         N         S  N
SULFUR DIOXIDE

20 C26PHTHALIC ANHYDRIDE PLANTS (O-XYLENE PROCESS)                  SIZE =   289.7917TONS/YR  ZAVE=   0.0650
   0.948    LB/TON    9.400   9.400   9.400 0.0205 0.090C   E6 TONS    0.61    0.12    0.84    2.73     6.46      6.46         ★

11 B04INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)             SIZE =     7.6874TONS/YR  ZAVE=   0.0170
   0.380    LB/TON    2.380   2.380   2.380 0.0395 0.110C   E6 TONS   30.50   19.69   92.89   22.84    64.84     64.84         ★

70 E01CRUDE OIL AND NATURAL GAS PROD. PLANTS(OIL & GAS PROD. FIELD  SIZE =    26.1060TONS/YR  ZAVE=   0.0230
5)  1.000   LB/TON    0.084   0.0     0.084 0.0    0.0      E6 TONS  499.78    0.0     0.0    20.99    20.99     20.99         ★ F*

20 C35ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE                   SIZE =     3.0000TONS/YR  ZAVE=   0.1500
   0.800    LB/TON    0.050   0.006   0.050 0.0305 0.039C   E6 TONS    1.48    0.44   -0.61    0.03     0.04      0.02       20.

44 D11PERIODIC KILN (OIL FIRED)                                     SIZE =     5.9000TONS/YR  ZAVE=   0.0250
   0.800    LB/TON    0.590   0.060   0.590 0.0335 0.0275   E6 TONS    0.20    0.07    0.06    0.05     0.06      0.04       30.

40 D13MINERAL WOOL MFG.                                             SIZE =     0.6371TONS/YR  ZAVE=   0.0777
   0.820    LB/TON    0.020   0.0     0.020 0.0295 0.0205   E6 TONS    9.24    2.68    1.85    0.08     0.09      0.05       40.

10 C01STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)       SIZE =     0.1682TONS/YR  ZAVE=   0.0232
   0.580    LB/TON    0.025   0.0     0.025 0.0205 0.0875   E6 TONS   41.19    8.24   35.84    0.30     0.56      0.24      320.

40 D19GLASS MANUFACTURING INDUSTRY  (LEAD GLASS)                    SIZE =     6.1508TONS/YR  ZAVE=   0.0051
   0.900    LB/TON    2.680   0.080   2.680 0.0335 0.0355   E6 TONS    0.65    0.21    0.23    0.78     1.06      0.54      520.

43 D11CURING & FIRING  (TUNNEL KILNS-OIL FIRED)                     SIZE =     6.0000TONS/YR  ZAVE=   0.0250
   0.800    LB/TON    0.400   0.040   0.400 0.0335 0.0275   E6 TONS    6.12    2.02    1.65    0.98     1.24      0.71      530.

11 C01STATIONERY PIPELINE COMPRESSOR ENGINES                        SIZE =     9.4860TONS/YR  ZAVE=   0.0040
   0.900    LB/PRO UNT   5.270   5.000   5.270 0.0205 0.0735   E6 PU    5.55    1.11    4.05   13.16    22.77     22.14      630.

44 D12PERIODIC KILN (COAL FIRED)                                    SIZE =   120.0000TONS/YR  ZAVE=   0.0250
   0.800    LB/TON   12.000   1.200  12.000 0.0335 0.0275   E6 TONS    0.51    0.17    0.14    2.45     3.11      1.79     1300.

10 A07MIXED FUEL BOILERS  (OIL & REFUSE)                            SIZE =    38.9999TONS/YR  ZAVE=   0.1200
   0.500    LB/TON    1.300   0.010   1.300 0.0395 0.0465   E6 TONS    7.50    2.92    3.45    2.44     3.56      1.50     2100.

70 E03CRUDE OIL & NATURAL GAS PROD. PLANTS (SULFUR RECOVERY)        SIZE =  1687.9304TONS/YR  ZAVE=   0.0362
   0.536    LB/TON    5.240   1.750 174.540 0.0355 0.032C   E6 TONS    3.32    1.16    1.23    4.64     6.36      4.14     2700. F*

10 C02STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)    SIZE =    11.2056TONS/YR  ZAVE=   0.0023
   0.580    LB/TON   16.800  16.000  16.800 0.0335 0.0285   E6 TONS   20.32    6.77    5.75   99.97   127.57    125.06     2900.

43 D12CURING & FIRING  (TUNNEL KILNS-COAL FIRED)                    SIZE =    72.0000TONS/YR  ZAVE=   0.0250
   0.800    LB/TON    7.200   0.720   7.200 0.0335 0.0275   E6 TONS    2.04    0.67    0.55    5.88     7.40      4.29     3200.
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Table A-3. (Cont'd)

```
        TABLE  2

    NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                     (2)      (3)      (4)    (5)     (6)                   (7)
                              EMISSION RATES          GROWTH RATES                                                       EMISSIONS
          EMISSION          ALLOWABLE    UNCONT    DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION          1000 TONS/YEAR          TONS/YEAR
RATING K    UNITS            E        E        E       P       P      UNITS          A       B       C       T        T        T        T -T
                              S        N        U       B       C                                            A        S        N         S  N
SULFUR DIOXIDE

40 D14FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)                                SIZE =    78.2382TONS/YR  ZAVE=    0.0410
   0.850      LB/TON      4.490   0.005    4.490 0.0305 0.075C   E6 TONS      1.47     0.44    1.56     2.81     5.78     1.97     3800.

10 B03MUNICIPAL INCINERATION < 50T/D                                           SIZE =     4.3750TONS/YR  ZAVE=    0.0062
   0.560      LB/TON      2.500   0.030    2.500 0.0395 0.0465   E6 TONS      7.50     2.92    3.45     5.25     7.66     3.26     4400.

51 B01SECONDARY COPPER PLANT  (SWEATING)                                       SIZE =  2361.5989TONS/YR  ZAVE=    0.0180
   0.820      LB/TON    320.000  32.000  320.000 0.0355 0.014C   E6 TONS      0.10     0.03    0.01    12.60    14.47     8.82     5700. C*

10 A06MIXED FUEL BOILERS  (COAL & REFUSE)                                      SIZE =   419.9995TONS/YR  ZAVE=    0.1200
   0.500      LB/TON     14.000   0.140   14.000 0.0395 0.0465   E6 TONS      7.50     2.92    3.45    26.25    38.32    16.24    22100.

80 A04CHEMICAL WOOD PULPING IND.  (ACID SULFITE)                               SIZE =  1779.4902TONS/YR  ZAVE=    0.0884
   0.660      LB/TON     61.000   3.100   61.000 0.0315 0.0  C   E6 TONS      3.78     1.17    0.0     76.09    76.09    53.70    22400.

40 D07GLASS MANUFACTURING INDUSTRY  (SODA-LIME GLASS)                          SIZE =    94.8585TONS/YR  ZAVE=    0.0524
   0.900      LB/TON      4.020   0.120    4.020 0.0335 0.0345   E6 TONS     20.23     6.68    6.88    36.60    49.04    25.25    23800.

50 A10BY-PRODUCT COKE OVEN                                                     SIZE =  1925.0991TONS/YR  ZAVE=    0.7200
   0.930      LB/TON      5.750   4.020    5.750 0.0285 0.0105   E6 TONS     79.27    22.20    7.93   211.95   233.14   208.91    24200.

20 C18EXPLOSIVE IND (LOW EXPLOSIVES)                                           SIZE =   298.9539TONS/YR  ZAVE=    0.0104
   0.830      LB/TON     69.400   5.550   69.400 0.0455 0.094C   E6 TONS      0.81     0.36    1.18    23.33    57.29    16.39    40900.

21 C20FUEL CONVERSION - BTU COAL GASIFICATION                                  SIZE = 18980.7168TONS/YR  ZAVE=    7.8840
   0.750      LB/TON      6.420   1.560    6.420 0.0    0.2005   E6 TONS     11.83     0.0    23.65    26.47    85.41    42.31    43100.

20 C31ETHYLENE                                                                 SIZE =  1066.6143TONS/YR  ZAVE=    0.5500
   0.820      LB/TON      4.730   0.015    4.730 0.0305 0.075C   E6 TONS     20.00     6.00   21.22    38.79    79.94    27.32    52600.

10 A08INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)                                 SIZE =   505.7317TONS/YR  ZAVE=    1.1830
   0.450   LB/E6 BTU      1.530   1.500    1.900 0.0335 0.014C   E12 BTU     20940     6910    3123     7209.    8264.    8216.    67700.

53 B01SECONDARY COPPER PLANT  (CONVERTER)                                      SIZE =  6420.5938TONS/YR  ZAVE=    0.0180
   0.820      LB/TON    870.000  87.000  870.000 0.0355 0.014C   E6 TONS      0.56     0.20    0.08   199.75   229.55   139.81    89700. C*

80 A03CHEMICAL WOOD INC.  (NSSC)                                               SIZE =  2333.7366TONS/YR  ZAVE=    0.0814
   0.940      LB/TON     61.000   3.100   61.000 0.0315 0.0485   E6 TONS      5.87     1.82    2.82   168.24   248.59   122.86   126000.

20 C17EXPLOSIVE IND (HIGH EXPLOSIVES)                                          SIZE =  1143.5315TONS/YR  ZAVE=    0.0367
   0.830      LB/TON     75.000   6.000   75.000 0.0455 0.094C   E6 TONS      2.88     1.30    4.19    89.64   220.13    62.97   157000.
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*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

```
          TABLE  3

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                  (2)     (3)     (4)    (5)    (6)                 (7)
                            EMISSION RATES       GROWTH RATES                                                 EMISSIONS
           EMISSION        ALLOWABLE   UNCONT  DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION           1000 TONS/YEAR          TONS/YEAR
RATING K    UNITS          E       E       E      P      P      UNITS        A       B       C        T       T        T        T -T
                           S       N       U      B      C                                    A        S        N        S  N
NITROGEN OXIDES

43 D10CURING & FIRING  (TUNNEL KILNS-GAS FIRED)                  SIZE =     1.5000TONS/YR  ZAVE=   0.0250
   0.800      LB/TON     0.150   0.150    0.150 0.0335 0.0275  E6 TONS    22.94    7.57    6.19     1.38    1.75     1.75        *

50 D02STEEL FOUNDRIES  (OPEN HEARTH)                             SIZE =     0.4050TONS/YR  ZAVE=   0.0900
   0.900      LB/TON     0.010   0.010    0.010 0.0285 0.0735  E6 TONS     6.29    1.76    4.59     0.03    0.05     0.05        *

44 D10PERIODIC KILN (GAS FIRED)                                  SIZE =     4.2000TONS/YR  ZAVE=   0.0250
   0.800      LB/TON     0.420   0.420    0.420 0.0335 0.0275  E6 TONS     7.56    2.49    2.04     1.27    1.61     1.61        *

44 D12PERIODIC KILN (COAL FIRED)                                 SIZE =    14.0000TONS/YR  ZAVE=   0.0250
   0.800      LB/TON     1.400   1.400    1.400 0.0335 0.0275  E6 TONS     0.51    0.17    0.14     0.29    0.36     0.36        *

40 D06FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)               SIZE =   389.1711TONS/YR  ZAVE=   0.0610
   0.840      LB/TON    22.600  22.600   22.600 0.0305 0.067C  E6 TONS     0.46    0.14    0.42     4.37    8.35     8.35        *

43 D12CURING & FIRING  (TUNNEL KILNS-COAL FIRED)                 SIZE =     9.0000TONS/YR  ZAVE=   0.0250
   0.800      LB/TON     0.900   0.900    0.900 0.0335 0.0275  E6 TONS     2.04    0.67    0.55     0.73    0.93     0.93        *

43 D11CURING & FIRING  (TUNNEL KILNS-OIL FIRED)                  SIZE =    11.0000TONS/YR  ZAVE=   0.0250
   0.800      LB/TON     1.100   1.100    1.100 0.0335 0.0275  E6 TONS     6.12    2.02    1.65     2.69    3.42     3.42        *

50 D01STEEL FOUNDRIES  (ELECTRIC ARC)                            SIZE =     2.7000TONS/YR  ZAVE=   0.0300
   0.900      LB/TON     0.200   0.200    0.200 0.0285 0.0735  E6 TONS    18.86    5.28   13.77     1.70    2.94     2.94        *

20 C35ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE                SIZE =     7.8000TONS/YR  ZAVE=   0.1500
   0.800      LB/TON     0.130   0.010    0.130 0.0305 0.035C  E6 TONS     1.48    0.44    0.61     0.08    0.11     0.06       50.

20 C45STYRENE                                                    SIZE =     7.6050TONS/YR  ZAVE=   0.3380
   0.900      LB/TON     0.050   0.004    0.050 0.0405 0.055C  E6 TONS     3.67    1.47    2.60     0.08    0.14     0.08       60.

50 A10BY-PRODUCT COKE OVEN                                       SIZE =    19.0836TONS/YR  ZAVE=   0.7200
   0.930      LB/TON     0.057   0.050    0.057 0.0285 0.0105  E6 TONS    79.27   22.20    7.93     2.10    2.31     2.21      100.

40 D13MINERAL WOOL MFG.                                          SIZE =     5.0971TONS/YR  ZAVE=   0.0777
   0.820      LB/TON     0.160   0.080    0.160 0.0295 0.0205  E6 TONS     9.26    2.68    1.85     0.61    0.73     0.58      150.

30 A05NITRATE FERTILIZER  (AMMONIUM NITRATE) PLANTS              SIZE =     6.9615TONS/YR  ZAVE=   0.1224
   0.910      LB/TON     0.125   0.003    0.125 0.0455 0.0205  E6 TONS     8.83    3.97    1.77     0.50    0.60     0.28      320.

44 D11PERIODIC KILN (OIL FIRED)                                  SIZE =    10.0000TONS/YR  ZAVE=   0.0250
   0.800      LB/TON     1.000   0.300    1.000 0.0335 0.0275  E6 TONS     2.04    0.67    0.55     0.82    1.04     0.69      340.

20 A18POTASH                                                     SIZE =    83.9159TONS/YR  ZAVE=   0.6000
   0.777      LB/TON     0.360   0.025    0.360 0.0205 0.030C  E6 TONS     6.82    1.36    2.35     0.95    1.28     0.80      480.
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*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

TABLE 3

1980-1990

NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED

NITROGEN OXIDES

RATING	K	POLLUTANT/SOURCE (1)	EMISSION UNITS	(2) EMISSION RATES ALLOWABLE E_S	(3) EMISSION RATES ALLOWABLE E_N	(4) EMISSION RATES UNCONT E_U	(5) GROWTH RATES DECIMAL/YEAR P_B	(6) GROWTH RATES DECIMAL/YEAR P_C	(7) INDUSTRY UNITS	SIZE =	CAPACITY/PRODUCTION A	CAPACITY/PRODUCTION B	CAPACITY/PRODUCTION C	ZAVE=	EMISSIONS 1000 TONS/YEAR T_A	EMISSIONS 1000 TONS/YEAR T_S	EMISSIONS 1000 TONS/YEAR T_N	EMISSIONS TONS/YEAR $T_S - T_N$
40	0.850	D14FIBERGLASS MFG. PLANTS (WOOL PROCESSING)	LB/TON	2.420	1.570	2.420	0.0305	0.0750	E6 TONS	42.1684TONS/YR	1.47	0.44	1.56	0.0410	1.51	3.12	2.39	720.
40	0.800	D10CERAMIC CLAY MFG	LB/TON	0.400	0.200	0.400	0.0335	0.0425	E6 TONS	0.5760TONS/YR	13.40	4.42	5.63	0.0036	2.14	3.04	2.24	800.
40	0.900	D19GLASS MANUFACTURING INDUSTRY (LEAD GLASS)	LB/TON	7.650	3.380	7.650	0.0335	0.0355	E6 TONS	17.5567TONS/YR	0.65	0.21	0.23	0.0051	2.24	3.02	1.57	1400.
10	0.500	A07MIXED FUEL BOILERS (OIL & REFUSE)	LB/TON	15.000	13.800	34.500	0.0395	0.0465	E6 TONS	1034.9990TONS/YR	7.50	2.92	3.45	0.1200	28.12	41.06	39.15	1900.
20	0.860	A04ADIPIC ACID PLANTS	LB/TON	12.000	1.610	53.600	0.0150	0.0400	E6 TONS	2604.4219TONS/YR	0.96	0.15	0.46	0.1130	4.94	7.32	4.57	2700.
10	0.560	B03MUNICIPAL INCINERATION < 50T/D	LB/TON	3.000	1.050	3.000	0.0395	0.0465	E6 TONS	5.2500TONS/YR	7.50	2.92	3.45	0.0062	6.30	9.20	5.72	3500.
40	0.900	D07GLASS MANUFACTURING INDUSTRY (SODA-LIME GLASS)	LB/TON	2.040	3.360	7.140	0.0335	0.0345	E6 TONS	168.4800TONS/YR	20.23	6.68	6.88	0.0524	18.57	24.89	14.64	10200.
12	0.900	B04INDUSTRIAL INCINERATION (IND ORGANIC LIQUID WASTE INC)	LB/TON	15.000	0.150	15.000	0.0355	0.1285	E6 TONS	72.3600TONS/YR	1.54	0.54	1.97	0.0107	10.37	23.64	6.91	16700.
20	0.830	C18EXPLOSIVE IND (LOW EXPLOSIVES)	LB/TON	30.000	2.100	30.000	0.0455	0.0940	E6 TONS	129.2309TONS/YR	0.81	0.36	1.18	0.0104	10.08	24.76	6.69	17500.
11	0.380	B04INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)	LB/TON	1.870	0.650	1.870	0.0395	0.1100	E6 TONS	6.0401TONS/YR	50.50	19.69	92.89	0.0170	17.94	50.95	24.85	20100.
20	1.000	B03POLYETHYLENE (HIGH DENSITY)	LB/GAL	22.500	11.250	22.500	0.0	0.1190	E6 GAL	1023.7490TONS/YR	2.49	0.0	5.17	0.0910	28.01	86.23	57.12	29100.
10	0.500	A06MIXED FUEL BOILERS (COAL & REFUSE)	LB/TON	35.000	5.250	15.000	0.0395	0.0465	E6 TONS	449.9995TONS/YR	7.50	2.92	3.45	0.1200	65.62	95.81	48.40	47600.
10	0.450	A03INDUSTRIAL BOILERS (10-250X10E6 BTU/HR)	LB/E6 BTU	0.411	0.365	0.640	0.0335	0.0140	E12 BTU	170.3519TONS/YR	20940	6910	3123	1.1830	1936.	2225.	2121.	104000.
11	0.900	C01STATIONERY PIPELINE COMPRESSOR ENGINES	LB/PRD UNT	60.500	15.130	60.500	0.0205	0.0735	E6 PU	108.8999TONS/YR	5.55	1.11	4.05	0.0040	151.10	261.40	156.02	105000.
10	0.580	C02STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)	LB/TON	179.000	123.000	179.000	0.0335	0.0285	E6 TONS	119.3929TONS/YR	20.52	6.77	5.75	0.0023	1065.19	1363.44	1160.17	203000.

*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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           TABLE  3

     NOTE: 1 IN RATING CCLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                          (2)       (3)       (4)    (5)     (6)                  (7)
                                     EMISSION RATES          GROWTH RATES                                                  EMISSIONS
            EMISSION              ALLOWABLE      UNCONT    DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION           1000 TONS/YEAR              TONS/YEAR
RATING K      UNITS               E         E         E      P       P       UNITS         A        B        C          T        T        T        T -T
                                   S         N         U      B       C                                         A        S        N        S N
NITROGEN OXIDES

20 C17EXPLOSIVE IND (HIGH EXPLOSIVES)                                              SIZE =   1951.6279TONS/YR  ZAVE=    0.0367
     0.830      LB/TON    128.000    6.400  128.030 0.0455 0.094C   E6 TONS      2.88     1.30     4.19   152.99  375.68    98.72  277000.

10 C01STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)                      SIZE =   1547.1724TONS/YR  ZAVE=    0.0232
     0.580      LB/TON    230.000  131.300  230.000 0.0205 0.0875   E6 TONS     41.19     8.24    35.84  2747.37 5137.58  3872.24 1270000.
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*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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           TABLE  4

    NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
      (1)                      (2)     (3)      (4)    (5)    (6)                      (7)
                                  EMISSION RATES       GROWTH RATES                                                                 EMISSIONS
              EMISSION           ALLOWABLE    UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION                       1000 TONS/YEAR              TONS/YEAR
RATING K       UNITS             E       E        E    P      P        UNITS          A       B        C            T        T          T          T -T
                                 S       N        U    B      C                                                     A        S          N          S  N
HYDROCARBONS

40 B01ASPHALT ROOFING  (SATURATOR)                                     SIZE =     3.2500TONS/YR  ZAVE=     0.0325
    0.800      LB/TON      0.250   0.250    0.250 0.0425 0.0435   E6 TONS      6.47    2.72     2.91      0.63     0.94      0.94         * F

20 D01SYNTHETIC RUBBER IND.  (STYRENE-BUTZDIENE)(SBR)                  SIZE =   183.3719TONS/YR  ZAVE=     0.1480
    0.390      LB/TON      4.200   3.100    4.200 0.0  S 0.0  C   E6 TONS      2.37    0.0      0.0       2.94     2.94      2.94         *

20 A13ACETIC ACID  (BUTANE)                                            SIZE =  1349.4595TONS/YR  ZAVE=     0.2295
    0.800      LB/TON     14.700   0.147   14.700 0.0    0.0      E6 TONS      0.46    0.0      0.0       2.70     2.70      2.70         *

11 B04INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)                 SIZE =     9.3024TONS/YR  ZAVE=     0.0170
    0.380      LB/TON      2.880   2.880    2.880 0.0395 0.110C   E6 TONS     50.50   19.69    92.89     27.63    78.46     78.46         *

70 E01CRUDE OIL & NATURAL GAS PROD. PLANTS (OIL & GAS PROD,FIELDS)  SIZE =   259.7908TONS/YR  ZAVE=     0.6230
    1.000      LB/TON      0.800   0.083    0.884 0.0    0.0      E6 TONS    499.78    0.0      0.0     199.91   199.91    199.91         * F

90 F02TEXTILE MFG  (HEAT SETTING/FINISHING)                            SIZE =    61.8253TONS/YR  ZAVE=     0.0091
    0.860      LB/TON      4.740   4.740   15.800 0.0425 0.081C   E6 TONS      1.18    0.50     1.39      2.41     5.24      5.24         *

44 D11PERIODIC KILN (OIL FIRED)                                        SIZE =     1.0000TONS/YR  ZAVE=     0.0250
    0.800      LB/TON      0.100   0.0      0.100 0.0335 0.0275   E6 TONS      2.04    0.67     0.55      0.08     0.10      0.05        50.

44 D10PERIODIC KILN (GAS FIRED)                                        SIZE =     0.4000TONS/YR  ZAVE=     0.0250
    0.800      LB/TON      0.040   0.0      0.040 0.0335 0.0275   E6 TONS      7.56    2.49     2.04      0.12     0.13      0.06        70.

44 D12PERIODIC KILN (COAL FIRED)                                       SIZE =     9.0000TONS/YR  ZAVE=     0.0250
    0.800      LB/TON      0.900   0.0      0.900 0.0335 0.0275   E6 TONS      0.51    0.17     0.14      0.18     0.23      0.12       110.

43 D10CURING & FIRING  (TUNNEL KILNS-GAS FIRED)                        SIZE =     0.2000TONS/YR  ZAVE=     0.0250
    0.800      LB/TON      0.020   0.0      0.020 0.0335 0.0275   E6 TONS     22.94    7.57     6.19      0.18     0.23      0.12       110.

43 D11CURING & FIRING  (TUNNEL KILNS-OIL FIRED)                        SIZE =     1.0000TONS/YR  ZAVE=     0.0250
    0.800      LB/TON      0.100   0.0      0.100 0.0335 0.0275   E6 TONS      6.12    2.02     1.65      0.24     0.31      0.16       150.

20 C25PHTHALIC ANHYDRIDE PLANTS  (NAPTHALENE PROCESS)                  SIZE =   308.2893TONS/YR  ZAVE=     0.0650
    0.948      LB/TON     10.000   0.100   10.000 0.0205 0.0  S   E6 TONS      0.19    0.04     0.0       0.90     0.90      0.72       180.

43 D12CURING & FIRING  (TUNNEL KILNS-COAL FIRED)                       SIZE =     0.0   TONS/YR  ZAVE=     0.0250
    0.800      LB/TON      0.600   0.0      0.0   0.0335 0.0275   E6 TONS      2.04    0.57     0.55      0.49     0.62      0.39       200.

20 C43ACETONE  (CYANOHYDRIN)                                           SIZE =   119.9999TONS/YR  ZAVE=     0.1500
    0.800      LB/TON      2.000   0.020    2.000 0.0305 0.060C   E6 TONS      0.38    0.11     0.30      0.30     0.54      0.21       330.

10 B03MUNICIPAL INCINERATION < 50T/D                                   SIZE =     0.3850TONS/YR  ZAVE=     0.0062
    0.560      LB/TON      0.220   0.010    0.220 0.0395 0.0465   E6 TONS      7.50    2.92     3.45      0.46     0.67      0.30       370.
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*Source categories footnoted by capital letter belong to the same facility and have been aggregated for analysis purposes.

★Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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          TABLE  4

   NOTE: 1 IN RATING CCLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                  (2)      (3)       (4)    (5)    (6)                  (7)
                           EMISSION RATES        GROWTH RATES                                                       EMISSIONS
             EMISSION     ALLOWABLE    UNCONT  DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION            1000 TONS/YEAR            TONS/YEAR
RATING K      UNITS       E        E        E      P      P      UNITS        A        B        C        T        T        T         T -T
                           S        N        U      B      C                                             A        S        N          S  N
HYDROCARBONS

12 B04INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)       SIZE =      2.8944TONS/YR  ZAVE=     0.0107
    0.900      LB/TON     0.600    0.0        0.600 0.035S 0.128S   E6 TONS     1.54     0.54     1.97      0.41     0.95     0.27       660.

20 B07POLYPROPLYENE                                                 SIZE =    929.6023TONS/YR  ZAVE=     0.1010
    0.780      LB/TON     0.590    0.236     23.600 0.003S 0.120C   E6 TONS     2.75     0.08     5.79      3.63     1.97     1.15       810.

20 C40ALLYL CHLORIDE                                                SIZE =    459.9998TONS/YR  ZAVE=     0.0575
    0.800      LB/TON    20.000    0.200     20.000 0.020S 0.045C   E6 TONS     0.14     0.03     0.08      1.10     1.70     0.89       820.

20 B11UREA-MELAMINE                                                 SIZE =    476.9995TONS/YR  ZAVE=     0.1590
    0.800      LB/TON     5.760    0.075      7.500 0.005S 0.040C   E6 TONS     0.79     0.04     0.38      1.83     2.71     1.75       960.

10 A07MIXED FUEL BOILERS  (OIL & REFUSE)                            SIZE =     27.3000TONS/YR  ZAVE=     0.1200
    0.500      LB/TON     0.910    0.285      0.910 0.039S 0.046S   E6 TONS     7.50     2.92     3.45      1.71     2.49     1.50      1000.

20 B13ACETATE RAYON                                                 SIZE =    198.5549TONS/YR  ZAVE=     0.0610
    0.930      LB/TON     7.000    0.350      7.000 0.045S 0.028S   E6 TONS     0.49     0.22     0.14      1.59     2.03     0.93      1100.

40 D14FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)                     SIZE =    227.3962TONS/YR  ZAVE=     0.0410
    0.850      LB/TON     3.390    2.100     13.030 0.030S 0.075C   E6 TONS     1.47     0.44     1.56      2.12     4.37     3.27      1100.

20 C26PHTHALIC ANHYDRIDE PLANTS (O-XYLENE PROCESS)                  SIZE =     73.9894TONS/YR  ZAVE=     0.0650
    0.948      LB/TON     2.400    0.020      2.400 0.020S 0.090C   E6 TONS     0.61     0.12     0.84      0.70     1.65     0.57      1100.

20 B10PHENOLIC RESINS                                               SIZE =    590.9993TONS/YR  ZAVE=     0.1970
    0.800      LB/TON     5.760    0.075      7.500 0.005S 0.040C   E6 TONS     0.99     0.05     0.47      2.27     3.37     2.18      1200.

10 A06MIXED FUEL BOILERS  (COAL & REFUSE)                           SIZE =     27.0000TONS/YR  ZAVE=     0.1200
    0.500      LB/TON     0.900    0.0        0.900 0.039S 0.046S   E6 TONS     7.50     2.92     3.45      1.69     2.46     1.03      1400.

20 D02POLY-BUTADIENE                                                SIZE =    153.1350TONS/YR  ZAVE=     0.0410
    0.830      LB/TON     9.000    0.090      9.000 0.033S 0.050C   E6 TONS     0.45     0.15     0.28      1.59     2.76     1.15      1600.

30 D08WHISKEY                                                       SIZE =     13.6082TONS/YR  ZAVE=    10.3800
    0.950      LB/GAL     0.003    0.000      0.003 0.032S 0.060S   E6 GAL      1633     523      960       2.       3.       1.        1900.

40 D13MINERAL WOOL MFG                                              SIZE =     64.3510TONS/YR  ZAVE=     0.0777
    0.820      LB/TON     2.020    0.869      2.020 0.029S 0.020S   E6 TONS     9.24     2.68     1.85      7.65     9.18     7.05      2100.

20 C41ACETONE (CUMENE)                                              SIZE =    201.5914TONS/YR  ZAVE=     0.0699
    0.800      LB/TON     7.210    0.072      7.210 0.030S 0.060C   E6 TONS     0.79     0.24     0.63      2.28     4.09     1.62      2500.

20 C44METHYL CHLOROFORM                                             SIZE =    250.5598TONS/YR  ZAVE=     0.0174
    0.800      LB/TON    36.000    0.360     36.000 0.030S 0.060C   E6 TONS     0.18     0.05     0.14      2.53     4.53     1.60      2700.
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*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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              TABLE  4

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                   (2)      (3)      (4)    (5)     (6)                 (7)
                               EMISSION RATES      GROWTH RATES                                                            EMISSIONS
             EMISSION       ALLOWABLE    UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION              1000 TONS/YEAR             TONS/YEAR
RATING K      UNITS           E        E        E      P       P      UNITS            A        B        C          T          T          T         T -T
                              S        N        U      B       C                                                  A          S          N         S  N
HYDROCARBONS

20 A12ACETIC ACID  (METHANOL)                                           SIZE =    369.9995TONS/YR  ZAVE=    0.0950
    0.800      LB/TON    15.000    0.150    15.000 0.020S 0.100C   E6 TONS      0.28     0.06     0.44       1.66       4.31       1.36      3000.

20 C45STYRENE                                                           SIZE =    249.4430TONS/YR  ZAVE=    0.3380
    0.900      LB/TON     1.640    0.016     1.640 0.040S 0.055C   E6 TONS      3.67     1.47     2.60       2.71       4.63       1.66      3000.

20 B12ABS-SAN RESIN PLANT                                               SIZE =    174.3524TONS/YR  ZAVE=    0.0574
    0.810      LB/TON     5.760    0.075     7.500 0.005S 0.104C   E6 TONS      0.77     0.04     1.30       1.79       4.81       1.74      3100.

20 C42ACETONE  (ISOPROPANOL)                                            SIZE =    353.5996TONS/YR  ZAVE=    0.0680
    0.800      LB/TON    13.000    0.130    13.000 0.030S 0.060C   E6 TONS      0.60     0.18     0.48       3.13       5.60       2.22      3400.

20 C33PHENOL PLANTS                                                     SIZE =    227.0351TONS/YR  ZAVE=    0.1165
    0.870      LB/TON     4.480    0.045     4.480 0.030S 0.075C   E6 TONS      1.40     0.42     1.49       2.73       5.62       1.95      3700.

20 B05POLYSTYRENE                                                       SIZE =    209.1959TONS/YR  ZAVE=    0.0447
    0.800      LB/TON     4.200    0.120    11.700 0.058C 0.020S   E6 TONS      2.77     2.10     0.55       4.65       5.58       1.26      4300.

80 B01PLYWOOD MANUFACTURING PLANT                                       SIZE =     21.3324TONS/YR  ZAVE=  151.2400
    0.910      LB/TON     0.000    0.000    0.000 0.050S 0.048C   E6 TONS     32282    16141    15343         5.         7.         3.      4600.

20 C40CARBON TETRACHORIDE  (CARBON DISULFIDE)                           SIZE =   1250.5591TONS/YR  ZAVE=    0.0977
    0.800      LB/TON    32.000    0.320    32.000 0.030S 0.060C   E6 TONS      0.37     0.11     0.29       4.72       8.45       3.38      5100.

20 A11ACETIC ACID  (ACETALDEHYDE)                                       SIZE =    525.8152TONS/YR  ZAVE=    0.0670
    0.800      LB/TON    19.620    0.196    19.620 0.040S 0.080C   E6 TONS  .   0.45     0.18     0.53       3.57       7.71       2.20      5500.

20 C39CARBON TETRACHLORIDE  (PROPANE)                                   SIZE =   1382.3987TONS/YR  ZAVE=    0.1080
    0.800      LB/TON    32.000    0.320    32.000 0.030S 0.060C   E6 TONS      0.41     0.12     0.32       5.24       9.38       3.72      5700.

10 A03INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)                          SIZE =      0.7320TONS/YR  ZAVE=    1.1830
    0.450   LB/E6 BTU     0.003    0.0       0.003 0.033S 0.014C   E12 BTU     20940     6910     3123         13.        13.         9.      6200.

21 C13AMMONIA PLANTS                                                    SIZE =     68.3086TONS/YR  ZAVE=    0.1668
    0.910      LB/TON     0.900    0.0       0.900 0.038S 0.034C   E6 TONS     21.48     8.27     8.53       6.83      12.29       5.41      6900.

40 B02ASPHALT ROOFING  (BLOWING)                                        SIZE =     47.9700TONS/YR  ZAVE=    0.0325
    0.800      LB/TON     3.690    0.180     3.690 0.042S 0.045S   E6 TONS      6.47     2.72     2.91       9.55      13.85       5.94      7900. *

20 C23MALEIC ANHYDRIDE                                                  SIZE =   2095.9990TONS/YR  ZAVE=    0.0200
    0.800      LB/TON   147.000    2.620   262.000 0.030S 0.044C   E6 TONS      0.17     0.05     0.09       9.78      15.04       6.99      8000.

20 B09SYNTHETIC FIBER INDUSTRY  (NYLON)                                 SIZE =    111.9999TONS/YR  ZAVE=    0.0400
    0.800      LB/TON     7.000    0.350     7.000 0.045S 0.089C   E6 TONS      1.84     0.83     2.48       5.15      12.09       3.30      8800.
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*Source categories footnoted by capital letter belong to the same facility and have been aggregated for analysis purposes.

*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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         TABLE  4

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
   (1)                        (2)     (3)       (4)    (5)    (6)                (7)
                                 EMISSION RATES       GROWTH RATES                                                       EMISSIONS
           EMISSION           ALLOWABLE     UNCONT  DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION              1000 TONS/YEAR            TONS/YEAR
RATING K   UNITS               E       E        E      P      P      UNITS          A        B       C           T       T        T      T -T
                               S       N        U      B      C                                              A       S        N        S  N
HYDROCARBONS

20 C48ACETIC ANHYDRIDE                                              SIZE =    779.6392TONS/YR  ZAVE=   0.1095
    0.800    LB/TON     17.800   0.178   17.800 0.030S 0.060C   E6 TONS     1.26     0.38    1.00     4.97  16.07    6.38    9700.
20 C30ETHYL BENZENE                                                 SIZE =   1539.9993TONS/YR  ZAVE=   0.7700
    0.800    LB/TON      5.000   0.050    5.000 0.030S 0.070C   E6 TONS     3.85     1.15    3.72     7.70  15.15    5.49    9700.
20 B04POLYETHYLENE (LOW DENSITY)                                    SIZE =   1521.1497TONS/YR  ZAVE=   0.1450
    0.867    LB/GAL      4.200   0.240   24.200 0.006S 0.082C   E6 GAL      4.61     0.28    5.53     8.39  15.46    6.49   10000.
20 C38CARBON TETRACHLORIDE (METHANE)                                SIZE =    930.2388TONS/YR  ZAVE=   0.0646
    0.800    LB/TON     36.000   0.360   36.000 0.030S 0.060C   E6 TONS     0.66     0.20    0.52     9.43  16.92    6.72   10200.
20 C19PRINTING INK PLANTS                                           SIZE =     42.5292TONS/YR  ZAVE=   0.0009
    0.830    LB/TON     48.000   4.800  120.000 0.045S 0.050C   E6 TONS     0.54     0.25    0.34    10.86  17.68    7.14   10500.
20 A04ADIPIC ACID PLANTS                                            SIZE =   2074.7913TONS/YR  ZAVE=   0.1130
    0.860    LB/TON     42.700   0.043   42.700 0.015C 0.040C   E6 TONS     0.96     0.15    0.46    17.59  26.04   14.78   11300.
60 F04P.T.M. ID.  (BULK GAS. TERMINALS) LOADING TANK TRUCKS/RR CAR  SIZE =    185.1043TONS/YR  ZAVE=   1.2200
    0.850    LB/GAL      0.071   0.004    0.357 0.080S 0.035C   E6 GAL    337.10   269.68  136.58    10.17  14.29    2.66   11600.
20 D07SYTHETIC RUBBER  (NEOPRENE)                                   SIZE =   3635.3967TONS/YR  ZAVE=   0.0730
    0.830    LB/TON    120.000   1.200  120.000 0.033S 0.050C   E6 TONS     0.27     0.09    0.17    13.30  21.66    9.06   12600.
20 C31ETHYLENE                                                      SIZE =    335.9946TONS/YR  ZAVE=   0.5500
    0.820    LB/TON      1.490   0.330    1.490 0.030S 0.075C   E6 TONS    20.00     0.00   21.22    12.22  25.14   12.24   12900.
20 C35ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE                   SIZE =   2093.9976TONS/YR  ZAVE=   0.1500
    0.800    LB/TON     34.900   0.349   34.900 0.030S 0.035C   E6 TONS     1.48     0.44    0.61    20.66  29.14   14.61   14500.
20 A14CYCLOHEXANE                                                   SIZE =   1120.4985TONS/YR  ZAVE=   0.1245
    0.900    LB/TON     20.000   0.200   20.000 0.030S 0.070C   E6 TONS     1.37     0.41    1.32    12.32  24.24    8.76   15900.
20 C16CHARCOAL PLANTS                                               SIZE =    375.4021TONS/YR  ZAVE=   0.0018
    0.850    LB/TON    484.000   4.800  484.000 0.023S 0.023S   E6 TONS     0.17     0.04    0.04    34.97  43.71   27.69   16600.
20 C32METHANOL PLANTS                                               SIZE =   1255.9995TONS/YR  ZAVE=   0.3140
    0.800    LB/TON     10.000   0.100   10.000 0.030S 0.050C   E6 TONS     4.58     1.37    2.88    16.30  29.82   12.98   16900.
20 B03POLYETHYLENE (HIGH DENSITY)                                   SIZE =   2693.5981TONS/YR  ZAVE=   0.0910
    1.000    LB/GAL      7.400   0.591   59.200 0.0    0.119C   E6 GAL      2.49     0.0     5.17     9.21  20.36   10.74   17600.
20 C15VARNISH                                                       SIZE =    191.3251TONS/YR  ZAVE=   0.0066
    0.850    LB/TON     34.900   0.679   67.900 0.067S 0.020C   E6 TONS     1.47     0.98    0.44    21.80  28.27    7.61   20700.
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*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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        TABLE  4

   NOTE: 1 IN RATING CCLLMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                     (2)     (3)      (4)     (5)    (6)                  (7)
                               EMISSION RATES      GROWTH RATES                                                      EMISSIONS
              EMISSION      ALLOWABLE   UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION              1000 TONS/YEAR            TONS/YEAR
RATING K       UNITS        E        E        E      P       P       UNITS        A       B        C        T        T          T          T -T
                            S        N        U      B       C                                            A        S          N          S  N
HYDROCARBONS

61 B03INDUSTRIAL SURFACE COATING  (MAGNET WIRE COATING)             SIZE =    67.9158TONS/YR  ZAVE=   0.0714
    0.820      LB/GAL      2.320   0.065    2.320 0.0425 0.078C   E6 GAL     14.79     0.21    16.55    14.07    29.81      8.77     21000.

22 C11ETHYLENE OXIDE PLANTS  (OXYGEN OXIDATION PROCESS)             SIZE =   1807.8362TONS/YR  ZAVE=   0.0966
    0.870      LB/TON     43.000   0.430   43.000 0.0805 0.040C   E6 TONS     0.95     0.76     0.40    17.77    26.30      3.78     22500.

20 D06ETHYLENE-PROPYLENE                                            SIZE =   1497.5994TONS/YR  ZAVE=   0.0520
    0.800      LB/TON     72.000   0.720   72.000 0.0335 0.120C   E6 TONS     0.34     0.11     0.71     9.68    30.35      6.72     23600.

20 C27TEREPHTHALIC ACIC PLANTS                                      SIZE =   1299.3691TONS/YR  ZAVE=   0.1472
    0.850      LB/TON     20.770   0.210   20.770 0.0455 0.090C   E6 TONS     1.61     0.73     2.21    14.25    33.73      8.10     25600.

20 C37VINYL ACETATE (ETHYLENE)                                      SIZE =   2071.1761TONS/YR  ZAVE=   0.1570
    0.850      LB/TON     43.030   0.430   43.030 0.0305 0.090C   E6 TONS     0.57     0.26     1.19    13.95    37.75     11.43     26300.

20 C34METHYL METHACRYLATE PLANTS                                    SIZE =   3347.9016TONS/YR  ZAVE=   0.0742
    0.800      LB/TON    112.800   1.128  112.800 0.0305 0.060C   E6 TONS     0.36     0.17     0.44    25.31    45.33     17.99     27300.

20 C36PROPYLENE  (OXIDE)                                            SIZE =   4367.8672TONS/YR  ZAVE=   0.1929
    0.800      LB/TON     39.200   0.392   39.200 0.0305 0.060C   E6 TONS     1.46     0.44     1.15    34.53    61.03     24.56     36500.

20 C49CYCLOHEXANOL/CYCLOHEXANONE                                    SIZE =   3443.2524TONS/YR  ZAVE=   0.0855
    0.800      LB/TON    100.680   1.007  100.680 0.0305 0.060C   E6 TONS     0.86     0.28     0.60    34.71    62.17     24.68     37500.

21 C20FUEL CONVERSION - BTU COAL GASIFICATION                       SIZE =  15285.0898TONS/YR  ZAVE=   7.8840
    0.750      LB/TON      5.170   0.880    5.170 0.0    0.200S   E6 TONS    11.83     0.0     23.65    22.95    66.78     28.98     37800.

60 B05GRAPHIC ARTS INDLSTRY  (FLEXOGRAPHY)                          SIZE =    247.1036TONS/YR  ZAVE=   0.0004
    0.880      LB/TON   1300.000  26.000 1300.000 0.0455 0.050C   E6 TONS     0.07     0.03     0.04    39.61    63.22     22.18     41000.

30 D11VEGETABLE OIL MFC.                                            SIZE =    825.2590TONS/YR  ZAVE=   0.0358
    0.920      LB/TON     37.900  15.200   38.000 0.0285 0.0275   E6 TONS     7.40     2.07     2.00   129.01   163.84    121.35     42500.

20 C47ACRYLIC ACID                                                  SIZE =   5560.6328TONS/YR  ZAVE=   0.0800
    0.800      LB/TON    173.770   1.740  173.770 0.0305 0.060C   E6 TONS     0.60     0.18     0.47    41.70    74.89     29.63     45300.

60 B07GRAPHIC  ARTS INCLSTRY  (LETTERPRESS)                         SIZE =     53.0560TONS/YR  ZAVE=   0.0002
    0.880      LB/TON    700.000  35.000  700.000 0.0455 0.050C   E6 TONS     0.15     0.07     0.09    44.94    73.20     27.14     46100.

20 C08FORMALDEHYDE PLANTS                                           SIZE =    144.4499TONS/YR  ZAVE=   0.0500
    0.900      LB/TON      6.420   0.064    6.420 0.0455 0.094C   E6 TONS     8.55     3.83    12.45    24.70    60.96     14.05     46900.

60 F03P.T.M. ID.  (SHIP & BARGE TRANSFER, GAS. & CRUDE OIL)         SIZE =    986.3730TONS/YR  ZAVE=  34.6400
    0.850      LB/GAL      0.067   0.001    0.067 0.0285 0.041C   E6 GAL     2170      803     1073      62.      92.       46.     46000.
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*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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          TABLE  4

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                  (2)      (3)      (4)     (5)    (6)                (7)
                            EMISSION RATES        GROWTH RATES                                                      EMISSIONS
               EMISSION     ALLOWABLE    UNCONT   DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION            1000 TONS/YEAR              TONS/YEAR
RATING K        UNITS     E        E        E       P      P      UNITS          A        B       C        T        T          T        T -T
                          S        N        U       B      C                                           A        S          N        S  N
HYDROCARBONS

70 E02CRUDE OIL & NATURAL GAS PROD. PLANTS (NATURAL GAS PROCESS.)  SIZE =   2510.7656TONS/YR  ZAVE=   10.0560
    0.840      LB/TON    0.561    0.005    0.561 0.035S 0.0     E6 TONS    595.61  208.46    0.0     140.34  140.34    91.06   48700. P*

63 B02INDUSTRIAL SURFACE COATING  (METAL COILS COATING)            SIZE =   7363.0508TONS/YR  ZAVE=    2.7716
    0.820      LB/GAL    5.340    0.320    6.480 0.042S 0.078C  E6 GAL      15.36    6.54   17.42    34.07   72.20    22.90   49300.

20 C07ETHYLENE DICHLORIDE PLANTS  (OXYCHLORINATION PROCESS)        SIZE =   5991.4648TONS/YR  ZAVE=    0.3222
    0.890      LB/TON   19.600    0.540   53.900 0.045S 0.090C  E6 TONS      4.49    2.02    8.14    30.36   71.69    18.22   53700.

30 D09BEER PROCESSING PLANTS                                       SIZE =    190.3090TONS/YR  ZAVE=    0.0431
    0.810   LB/PRD UNT  10.900    0.109   10.900 0.040S 0.070C  E6 PU       10.10    4.04    9.77    44.59   87.71    27.36   60800.

61 B02INDUSTRIAL SURFACE COATING  (LARGE APPLIANCE COATING)        SIZE =    174.0204TONS/YR  ZAVE=    0.0655
    0.820      LB/GAL    5.340    0.065    6.480 0.042S 0.078C  E6 GAL      19.51    8.19   21.64    42.72   90.52    25.58   64900.

20 C03CARBON BLACK  (FURNACE PROCESS)                              SIZE =   2582.9970TONS/YR  ZAVE=    0.0830
    0.820      LB/TON  100.000    0.100  100.000 0.045S 0.025C  E6 TONS      2.36    1.06    0.66    96.76  123.36    53.29   70500.

62 B02INDUSTRIAL SURFACE COATING  (AUTOMOBILES)                    SIZE =   1845.7065TONS/YR  ZAVE=    0.0650
    0.910      LB/GAL    5.340    0.310    6.100 0.042S 0.029C  E6 GAL      42.60   17.89   14.10   103.51  137.76    64.55   73200.

50 A10BY-PRODUCT COKE OVEN                                         SIZE =   2002.1030TONS/YR  ZAVE=    0.7200
    0.930      LB/TON    5.980    0.042    5.980 0.028S 0.010S  E6 TONS     79.27   22.20    7.93   220.43  242.47   159.29   83200.

20 C28DIMETHYL TEREPHTHALATE PLANTS                                SIZE =   5346.4922TONS/YR  ZAVE=    0.3400
    0.850      LB/TON   37.000    0.370   37.000 0.045S 0.090C  E6 TONS      2.95    1.33    4.03    46.39  109.62    26.36   83500.

60 B04GRAPHIC ARTS INDUSTRY  (GRAVURE)                             SIZE =    324.3237TONS/YR  ZAVE=    0.0006
    0.880      LB/TON 1300.000   65.000 1300.000 0.045S 0.050C  E6 TONS      0.16    0.07    0.10    89.30  145.46    53.93   91500.

20 B17PLASTICS AND RESINS  (ACRYLIC)                               SIZE =    219.2399TONS/YR  ZAVE=    0.0021
    0.870      LB/TON  240.000    2.400  240.000 0.045S 0.110C  E6 TONS      0.41    0.18    0.75    42.80  121.54    24.52   97300.

20 C06ACRYLONITRILE PLANTS                                         SIZE =   4747.1250TONS/YR  ZAVE=    0.0743
    0.900      LB/TON   91.000    7.920  142.000 0.045S 0.100C  E6 TONS      1.33    0.60    2.12    54.46  141.26    39.64  102000.

10 C02STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)   SIZE =     20.8771TONS/YR  ZAVE=    0.0023
    0.380      LB/TON   31.300    0.0     31.300 0.033S 0.028S  E6 TONS     20.52    6.77    5.75   186.26  236.41   124.79  114000.

70 D02PETROLEUM REFINERY MISC  (VACUUM PROD. SYS.)                 SIZE =    548.0706TONS/YR  ZAVE=   21.4930
    0.850   LB/BARREL    0.060    0.0      0.060 0.021S 0.044C  B6 BBL      6840    1436    3732     174.     270.     138.  132000. E*

70 D01PETROLEUM REFINERY MISC.  (PROCESS DRAINS & WASTE H2O)       SIZE =   1826.9036TONS/YR  ZAVE=   21.4930
    0.850   LB/BARREL    0.077    0.010    0.200 0.021S 0.044C  B6 BBL      6840    1436    3732     224.     346.     199.  147000. E*
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*Source categories footnoted by capital letter belong to the same facility and have been aggregated for analysis purposes.

⁑Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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              TABLE  4                                             1980-1990

   NOTE: 1 IN RATING CCLLMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
      (1)                 (2)     (3)      (4)    (5)     (6)              (7)
                             EMISSION RATES       GROWTH RATES                                               EMISSIONS
             EMISSION       ALLOWABLE   UNCONT    DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION             1000 TONS/YEAR        TONS/YEAR
RATING K      UNITS        E        E        E     P       P      UNITS       A        B      C         T        T         T      T -T
                            S        N        U    B       C                                          A        S          N       S  N
HYDROCARBONS

64 B02INDUSTRIAL SURFACE COATING  (FABRIC COATING)                  SIZE =    594.3252TONS/YR  ZAVE=    0.2237
   0.820     LB/GAL     5.340   0.260    6.480 0.042S 0.078C   E6 GAL      51.90   21.80   58.09   113.63  240.81    74.42  166000.

21 C11ETHYLENE OXIDE PLANTS  (AIR OXIDATION PROCESS)                SIZE =   7063.1758TONS/YR  ZAVE=    0.0966
   0.870     LB/TON   168.000   1.680  168.000 0.080S 0.040C   E6 TONS      1.92    1.54    0.92   140.31  207.70    29.86  178000.

60 B01DRY CLEANING                                                  SIZE =     70.0250TONS/YR  ZAVE=    0.0003
   1.000     LB/TON   258.000  24.400  508.700 0.050S 0.009C   E6 TONS      3.12    1.56    0.29   602.48  440.20   223.84  216000.

70 D03PETROLEUM REFINERY MISC  (PROCESS UNIT TURN)                  SIZE =   2740.3557TONS/YR  ZAVE=   21.4930
   0.850   LB/BARREL    0.201   0.005   0.300 0.021S 0.044C   B6 BBL      6840    1436    3732     584.    903.     473.  430000.

63 B03INDUSTRIAL SURFACE COATING  (PAPER COATING)                   SIZE =  15709.6445TONS/YR  ZAVE=    5.9130
   0.820     LB/GAL     5.340   0.260    6.480 0.042S 0.078C   E6 GAL     202.28   84.96  226.40   442.87  934.56   290.06  649000.

10 C01STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)       SIZE =    376.7026TONS/YR  ZAVE=    0.0232
   0.580     LB/TON    56.000   0.0     56.000 0.020S 0.087S   E6 TONS     41.19    8.24   35.84   608.93 1250.89   535.14  716000.

62 B03INDUSTRIAL SURFACE COATING  (CAN COATING)                     SIZE =  15279.1328TONS/YR  ZAVE=    7.7800
   0.820     LB/GAL     4.790   0.050    4.790 0.042S 0.078C   E6 GAL     273.25  114.76  305.84   536.64 1137.27   319.87  817000.
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*Sources categories footnoted by capital letter belong to the same facility and have been aggregated for analysis purposes.

Table A-3. (Cont'd)

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         TABLE  5

   NOTE: 1 IN RATING CCLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                  (2)     (3)      (4)    (5)    (6)                    (7)
                            EMISSION RATES        GROWTH RATES                                                    EMISSIONS
            EMISSION       ALLOWABLE    UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION           1000 TONS/YEAR             TONS/YEAR
RATING K     UNITS          E       E        E      P      P     UNITS        A       B       C        T        T        T        T -T
                            S       N        U      B      C                                         A        S        N        S  N
CARBON MONOXIDE

50 CO4GREY IRON FOUNDRIES  (CUPCLA)                                  SIZE =  10462.4922TONS/YR  ZAVE=    0.0900
    0.930     LB/TON   250.000   8.000  250.000 0.0   -0.018S   E6 TONS     13.44    0.0    -2.42  1562.40 1281.17 1553.40 -272233.

30 A10BY-PRODUCT COKE CVEN                                           SIZE =    893.9150TONS/YR  ZAVE=    0.7200
    0.930     LB/TON     2.670   2.670    2.670 0.028S 0.010S   E6 TONS     79.27   22.20    7.93    98.42  108.26  108.26       *

40 D06FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)                   SIZE =     34.9566TONS/YR  ZAVE=    0.0410
    0.840     LB/TON     2.030   2.030    2.030 0.030S 0.067C   E6 TONS      0.46    0.14    0.42     0.39    0.75    0.75       *

20 A13ACETIC ACID  (BUTANE)                                          SIZE =    403.9197TONS/YR  ZAVE=    0.2295
    0.800     LB/TON     4.400   0.044    4.400 0.0    0.0      E6 TONS      0.46    0.0     0.0      0.81    0.81    0.81       *

44 D10PERIODIC KILN (GAS FIRED)                                      SIZE =      1.1000TONS/YR  ZAVE=    0.0250
    0.800     LB/TON     0.110   0.110    0.110 0.033S 0.027S   E6 TONS      7.56    2.49    2.04     0.33    0.42    0.42       *

44 D12PERIODIC KILN (CCAL FIRED)                                     SIZE =     32.0000TONS/YR  ZAVE=    0.0250
    0.800     LB/TON     3.200   3.200    3.200 0.033S 0.027S   E6 TONS      0.51    0.17    0.14     0.65    0.83    0.83       *

11 B04INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)               SIZE =     27.3581TONS/YR  ZAVE=    0.0170
    0.380     LB/TON     8.470   8.470    8.470 0.039S 0.110C   E6 TONS     50.50   19.69   92.89    81.27  230.76  230.76       *

10 B03MUNICIPAL INCINERATION < 50T/D                                 SIZE =     61.2499TONS/YR  ZAVE=    0.0062
    0.560     LB/TON    35.000  35.000   35.000 0.039S 0.046S   E6 TONS      7.50    2.92    3.45    73.50  107.31  107.31       *

43 D10CURING & FIRING  (TUNNEL KILNS-GAS FIRED)                      SIZE =      0.4000TONS/YR  ZAVE=    0.0250
    0.800     LB/TON     0.040   0.040    0.040 0.033S 0.027S   E6 TONS     22.94    7.57    6.19     0.37    0.47    0.47       *

43 D12CURING & FIRING  (TUNNEL KILNS-COAL FIRED)                     SIZE =     19.0000TONS/YR  ZAVE=    0.0250
    0.800     LB/TON     1.900   1.900    1.900 0.033S 0.027S   E6 TONS      2.34    0.67    0.55     1.55    1.97    1.97       *

10 A07MIXED FUEL BOILERS  (OIL & REFUSE)                             SIZE =    509.9995TONS/YR  ZAVE=    0.1200
    0.500     LB/TON    17.000  17.000   17.000 0.039S 0.046S   E6 TONS      7.50    2.92    3.45    31.87   46.54   46.54       *

10 A06MIXED FUEL BOILERS  (COAL & REFUSE)                            SIZE =    539.9993TONS/YR  ZAVE=    0.1200
    0.500     LB/TON    18.000  18.000   18.000 0.039S 0.046S   E6 TONS      7.50    2.92    3.45    33.75   49.27   49.27       *

40 D14FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)                      SIZE =     39.3804TONS/YR  ZAVE=    0.0410
    0.850     LB/TON     2.260   2.240    2.260 0.030S 0.075C   E6 TONS      1.47    0.44    1.56     1.41    2.91    2.89      20.

12 B04INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)        SIZE =      0.2412TONS/YR  ZAVE=    0.0107
    0.900     LB/TON     0.050   0.0      0.050 0.035S 0.128S   E6 TONS      1.54    0.54    1.97     0.03    0.08    0.02      60.

20 C33PHENOL PLANTS                                                  SIZE =     24.3252TONS/YR  ZAVE=    0.1165
    0.870     LB/TON     0.480   0.005    0.480 0.030S 0.075C   E6 TONS      1.40    0.42    1.49     0.29    0.60    0.21     390.
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*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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          TABLE  5

   NOTE: 1 IN RATING CCLLMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                   (2)      (3)      (4)     (5)    (6)                (7)
                              EMISSION RATES      GROWTH RATES                                                    EMISSIONS
             EMISSION      ALLOWABLE    UNCONT   DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION               1000 TONS/YEAR          TONS/YEAR
RATING K     UNITS          E        E         E      P      P        UNITS        A         B         C             T         T           T        T -T
                             S        N         U      B      C                                                A         S           N        S  N
CARBON MONOXIDE

20 A11ACETIC ACID  (ACETALDEHYDE)                                     SIZE =    108.2719TONS/YR  ZAVE=    0.0670
   0.800       LB/TON      4.040    0.040     4.040 0.040S 0.080C   E6 TONS     0.45      0.18      0.53       0.74      1.59       0.45      1100.

20 C25PHTHALIC ANHYDRICE PLANTS  (NAPTHALENE PROCESS)                 SIZE =   3082.8945TONS/YR  ZAVE=    0.0650
   0.948       LB/TON    100.000    1.000   100.000 0.020S 0.0   S   E6 TONS     0.19      0.04      0.0        9.01      9.01       7.22      1800.

40 B02ASPHALT ROOFING  (BLOWING)                                      SIZE =     19.5000TONS/YR  ZAVE=    0.0325
   0.800       LB/TON      1.500    0.015     1.500 0.042S 0.045S   E6 TONS     6.47      2.72      2.91       3.88      5.63       2.29      3300.

20 C07ETHYLENE DICHLORICE PLANTS  (OXYCHLORINATION PROCESS)           SIZE =    144.5066TONS/YR  ZAVE=    0.3222
   0.690       LB/TON      1.300    0.013     1.300 0.045S 0.090C   E6 TONS     4.49      2.02      6.14       2.01      4.77       1.14      3600.

20 C47ACRYLIC ACID                                                    SIZE =    767.9995TONS/YR  ZAVE=    0.0800
   0.800       LB/TON     24.000    0.240    24.000 0.030S 0.060C   E6 TONS     0.60      0.18      0.47       5.76     10.32       4.09      6200.

20 C16CHARCOAL PLANTS                                                 SIZE =    248.1996TONS/YR  ZAVE=    0.0018
   0.850       LB/TON    320.000    3.200   320.000 0.023S 0.025S   E6 TONS     0.17      0.04      0.04      23.12     28.90      17.91     11000.

20 C48ACETIC ANHYDRIDE                                                SIZE =    959.2188TONS/YR  ZAVE=    0.1095
   0.800       LB/TON     21.900    0.219    21.900 0.030S 0.060C   E6 TONS     1.26      0.38      1.00      11.04     19.77       7.85     11900.

20 C32METHANOL PLANTS                                                 SIZE =   1235.9995TONS/YR  ZAVE=    0.3140
   0.800       LB/TON     10.000    0.100    10.000 0.030S 0.050C   E6 TONS     4.58      1.37      2.88      18.30     29.12      12.98     16800.

20 A14CYCLOHEXANE                                                     SIZE =   1400.6230TONS/YR  ZAVE=    0.1245
   0.900       LB/TON     25.000    0.250    25.000 0.030S 0.070C   E6 TONS     1.37      0.41      1.32      15.40     30.20      10.98     19300.

20 A04ADIPIC ACID PLANTS                                              SIZE =   5587.8438TONS/YR  ZAVE=    0.1130
   0.860       LB/TON    115.000    0.115   115.000 0.015C 0.040C   E6 TONS     0.96      0.15      0.46      47.37     70.12      39.80     30300.

20 C49CYCLOHEXANOL/CYCLCHEXANONE                                      SIZE =   3812.2698TONS/YR  ZAVE=    0.0855
   0.800       LB/TON    111.470    1.115   111.470 0.030S 0.060C   E6 TONS     0.86      0.26      0.66      38.43     68.63      27.32     41500.

11 C01STATIONERY PIPELINE COMPRESSOR ENGINES                          SIZE =     52.8299TONS/YR  ZAVE=    0.0040
   0.900    LB/PRD UNT    29.350    9.640    29.350 0.020S 0.073S   E6 PU       5.55      1.11      4.05      73.30    126.61      81.03     45800.

10 A03INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)                        SIZE =      8.5708TONS/YR  ZAVE=    1.1830
   0.450     LB/E6 BTU     0.032    0.0       0.032 0.033S 0.014C   E12 BTU    20940      6910      3123       152.      174.       102.     72700.

20 C23MALEIC ANHYDRIDE                                                SIZE =  12479.9922TONS/YR  ZAVE=    0.0200
   0.800       LB/TON   1340.000   15.600  1560.000 0.030S 0.044C   E6 TONS     0.17      0.05      0.09      69.14    137.11      63.27     73800.

20 C08FORMALDEHYDE PLANTS                                             SIZE =    352.5747TONS/YR  ZAVE=    0.0500
   0.900       LB/TON     15.670    0.157    15.670 0.045S 0.094C   E6 TONS     8.55      3.85     12.45      60.29    148.05      34.31    114000.
```

*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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        TABLE  5

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                  (2)       (3)      (4)    (5)     (6)                      (7)
                              EMISSION RATES        GROWTH RATES                                                      EMISSIONS
              EMISSION        ALLOWABLE    UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION          1000 TONS/YEAR            TONS/YEAR
RATING K       UNITS          E         E        E      P       P      UNITS       A       B       C        T       T       T       T -T
                               S         N        U      B       C                                          A       S       N       S  N
CARBON MONOXIDE

20 C26PHTHALIC ANHYDRICE PLANTS (O-XYLENE PROCESS)                    SIZE =  9279.5078TONS/YR  ZAVE=    0.0650
    0.948      LB/TON   301.000   3.010  301.000 0.020S 0.090C   E6 TONS      0.61    0.12    0.84   87.32  206.71   71.22  135000.

40 D13MINERAL WOOL MANUFACTURING                                      SIZE =  3007.2981TONS/YR  ZAVE=    0.0777
    0.820      LB/TON    94.400   4.720   94.400 0.029S 0.020S   E6 TONS      9.24    2.68    1.85  357.62  429.15  262.08  166000.

20 C06ACRYLONITRILE PLANTS                                            SIZE =  5315.4453TONS/YR  ZAVE=    0.0743
    0.900      LB/TON   159.000   8.000  159.000 0.045S 0.100C   E6 TONS      1.33    0.60    2.12   93.16  246.82   62.12  185000.

10 C02STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)      SIZE =    36.5519TONS/YR  ZAVE=    0.0023
    0.580      LB/TON    54.800   0.0     54.800 0.033S 0.028S   E6 TONS     20.52    6.77    5.75  326.10  417.41  218.49  199000.

10 C01STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)         SIZE =   287.9082TONS/YR  ZAVE=    0.0232
    0.580      LB/TON    42.800   0.0     42.800 0.020S 0.087S   E6 TONS     41.19    8.24   35.84  511.25  956.04  409.00  547000.

20 C03CARBON BLACK  (FURNACE PROCESS)                                 SIZE = 72323.8750TONS/YR  ZAVE=    0.0630
    0.820      LB/TON  2800.000   2.800 2800.000 0.045S 0.025C   E6 TONS      2.36    1.06    0.66 2709.28 3468.09 1492.08 1980000.
```

*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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               TABLE  6

   NOTE: 1 IN RATING CCLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
      (1)                  (2)     (3)      (4)   (5)    (6)                 (7)
                             EMISSION RATES       GROWTH RATES                                                   EMISSIONS
              EMISSION      ALLCWABLE   UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION            1000 TONS/YEAR            TONS/YEAR
RATING K      UNITS          E       E        E     P      P      UNITS        A        B        C           T        T        T       T -T
                             S       N        U     B      C                                            A        S        N         S  N
LEAD

50 C04GREY IRON FOUNDRIES (CUPOLA)                                     SIZE =     25.1100TONS/YR  ZAVE=    0.0900
    0.930     LB/TON     0.600   0.030     0.600 0.0  S-0.018S   E6 TONS    13.44     0.0     -2.42     3.75     3.07      3.72        ★

70 F01GASOLINE ADDITIVES  (SODIUM-LEAD)                                SIZE =   1930.3953TONS/YR  ZAVE=    0.0600
    0.720     LB/TON    10.780   0.890    89.400 0.045S-0.099C   E6 TONS     0.25     0.11    -0.16     0.96     0.34      0.51        ★

70 F02GASOLINE ADDITIVES  (ELECTROLYTIC)                               SIZE =    249.3437TONS/YR  ZAVE=    0.0215
    0.720     LB/TON     4.100   1.000    32.200 0.045S-0.099C   E6 TONS     0.02     0.01    -0.01     0.03     0.01      0.02        ★

50 C03GREY IRON FOUNDRIES  (REVERBERATORY)                             SIZE =      1.9530TONS/YR  ZAVE=    0.0600
    0.930     LB/TON     0.070   0.0       0.070 0.028S 0.136S   E6 TONS     0.54     0.15     0.73     0.02     0.04      0.01       30.

50 E04SECONDARY ZINC SMELTERS  (REVERBERATORY SWEAT FURNACES)          SIZE =      1.4522TONS/YR  ZAVE=    0.0077
    0.820     LB/TON     0.460   0.050     0.460 0.033S 0.018C   E6 TONS     0.30     0.10     0.06     0.06     0.07      0.04       30.

50 E03SECONDARY ZINC SMELTERS  (KETTLE FURNACE)                        SIZE =      1.4522TONS/YR  ZAVE=    0.0077
    0.820     LB/TON     0.460   0.050     0.460 0.033S 0.018C   E6 TONS     0.30     0.10     0.06     0.06     0.07      0.04       30.

45 E01METALIC MINERALS MINING (ZINC MINE & CRUSHING)                   SIZE =   1349.9983TONS/YR  ZAVE=   30.0000
    0.900     LB/TON     0.100   0.010     0.100 0.028S 0.012S   E6 TONS     8.92     2.50     1.07     0.40     0.45      0.31      140.

44 E01METALIC MINERALS MINING (LEAD MINING)                            SIZE =      1.3500TONS/YR  ZAVE=    0.0300
    0.900     LB/TON     0.100   0.010     0.100 0.028S 0.013S   E6 TONS     9.26     2.59     1.20     0.42     0.47      0.32      150.

42 E01METALLIC MINERALS MINING (FERROALLOY)                            SIZE =      3.7800TONS/YR  ZAVE=    0.0280
    0.900     LB/TON     0.300   0.003     0.300 0.028C 0.015S   E6 TONS  .  3.73     1.19     0.56     0.50     0.58      0.35      230.

50 C02GREY IRON FOUNDRIES (ELECTRIC ARC)                               SIZE =      2.0925TONS/YR  ZAVE=    0.0900
    0.930     LB/TON     0.050   0.0       0.050 0.028S 0.136S   E6 TONS     6.18     1.73     8.40     0.14     0.34      0.13      240.

10 B03MUNICIPAL INCINERATION < 50T/D                                   SIZE =      0.7000TONS/YR  ZAVE=    0.0062
    0.560     LB/TON     0.400   0.0       0.400 0.039S 0.046S   E6 TONS     7.50     2.92     3.45     0.84     1.23      0.51      710.

40 D19GLASS MANUFACTURING INDUSTRY  (LEAD GLASS)                       SIZE =     13.7700TONS/YR  ZAVE=    0.0051
    0.900     LB/TON     6.000   0.060     6.000 0.033S 0.035S   E6 TONS     0.65     0.21     0.23     1.75     2.37      1.19     1200.

11 B04INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)                  SIZE =      1.2920TONS/YR  ZAVE=    0.0170
    0.380     LB/TON     0.400   0.040     0.400 0.039S 0.110C   E6 TONS    50.50    19.69    92.89     3.84    10.90      3.20     7730.
```

★Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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            TABLE  7

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                  (2)      (3)      (4)    (5)     (6)              (7)
                             EMISSION RATES       GROWTH RATES                                                  EMISSIONS
           EMISSION        ALLOWABLE      UNCONT  DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION           1000 TONS/YEAR             TONS/YEAR
RATING K    UNITS          E        E        E      P      P     UNITS      A        B       C           T        T          T          T -T
                           S        N        U      B      C                                       A         S          N            S  N
ACID MIST

20 C18EXPLOSIVE IND (LOW EXPLOSIVES)                              SIZE =     1.2923TONS/YR  ZAVE=    0.0104
    0.830      LB/TON     0.300    0.006    0.300 0.045S 0.094C  E6 TONS    0.81     0.36    1.18     0.10     0.25       0.06       190.

10 A06MIXED FUEL BOILERS  (COAL & REFUSE)                         SIZE =     6.6000TONS/YR  ZAVE=    0.1200
    0.500      LB/TON     0.220    0.010    0.220 0.039S 0.066S  E6 TONS    7.50     2.92    3.45     0.41     0.90       0.27       330.

20 C17EXPLOSIVE IND (HIGH EXPLOSIVES)                             SIZE =  1219.7673TONS/YR  ZAVE=    0.0367
    0.830      LB/TON    20.000    1.600   80.000 0.045S 0.094C  E6 TONS    2.88     1.30    4.19    23.90    58.70      16.79     41900.
```

*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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              TABLE  8

   NOTE: 1 IN RATING CCLLMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                  (2)      (3)      (4)   (5)    (6)                   (7)
                           EMISSION RATES        GROWTH RATES                                                         EMISSIONS
               EMISSION     ALLOWABLE   UNCONT   DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION               1000 TONS/YEAR              TONS/YEAR
RATING K        UNITS       E        E        E     P      P        UNITS          A        B        C         T          T          T         T -T
                            S        N        U     B      C                                                 A          S          N         S  N
HYDROGEN SULFIDES

20 806VISCOSE RAYON                                                    SIZE =    265.9597TONS/YR  ZAVE=    0.0610
    0.800       LB/TON    10.900   1.600    10.900 0.0455 0.0       E6 TONS      0.49     0.22     0.0       2.14       2.14       1.32       820.

20 C03CARBON BLACK  (FLRNACE PROCESS)                                  SIZE =   1549.7986TONS/YR  ZAVE=    0.0630
    0.820       LB/TON    60.000   0.060    60.000 0.0455 0.025C    E6 TONS      2.36     1.06     0.66     38.06      74.32      31.97     42300.
```

*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

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              TABLE  9

   NOTE: 1 IN RATING CCLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                     (2)      (3)       (4)    (5)    (6)                  (7)
                                EMISSION RATES        GROWTH RATES                                                        EMISSIONS
              EMISSION         ALLOWABLE    UNCONT    DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION            1000  TONS/YEAR              TONS/YEAR
RATING K       UNITS            E        E         E       P       P       UNITS         A        B       C            T         T          T         T -T
                                S        N         U       B       C                                           A          S          N          S  N
FLUORIDES

43 DIOCURING & FIRING  (TUNNEL KILNS-GAS FIRED)                             SIZE =      10.0000TONS/YR  ZAVE=    0.0250
   0.800       LB/TON     1.000    0.300     1.000 0.0335 0.0275   E6 TONS     22.94     7.57    6.19      9.18    11.69      7.80     3900.

10 AO3INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)                              SIZE =       0.0571TONS/YR  ZAVE=    1.1830
   0.450   LB/E6 BTU      0.003    0.000     0.003 0.0335 0.014C  E12 BTU    20940     6910    3123       15.      17.        11.      6100.

20 AO8HYDROFLUORIC ACIC PLANTS                                              SIZE =     343.8992TONS/YR  ZAVE=    0.0222
   0.980       LB/TON    50.000    0.200    50.000 0.0455 0.0675   E6 TONS      0.60     0.27    0.40     14.72    24.59      8.16    16400.
```

*Source categories indicate small potential emission reduction or decreasing capacity.

Table A-3. (Cont'd)

```
              TABLE  9

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                    (2)      (3)      (4)   (5)    (6)                  (7)
                              EMISSION RATES       GROWTH RATES                                                      EMISSIONS
              EMISSION       ALLOWABLE   UNCONT  DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION          1000 TONS/YEAR          TONS/YEAR
RATING K       UNITS         E        E        E      P      P      UNITS        A        B       C      T         T          T       T -T
                             S        N        U      B      C        .                            A         S          N        S  N
FLUORIDES

40 D08FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)                     SIZE =     34.4400TONS/YR  ZAVE=    0.0410
     0.840      LB/TON     2.000    2.000     2.000 0.030S 0.067C   E6 TONS     0.46     0.14     0.42     0.39     0.74     0.74       *

50 E03SECONDARY ZINC SMELTERS  (GALVINIZING)                           SIZE =      2.2099TONS/YR  ZAVE=    0.0077
     0.820      LB/TON     0.700    0.070     0.700 0.033S 0.018C   E6 TONS     0.03     0.01     0.01     0.01     0.01     0.01       4.  F*

50 E02SECONDARY ZINC SMELTERS  (HORIZONTAL MUFFLE)                     SIZE =      2.2099TONS/YR  ZAVE=    0.0077
     0.820      LB/TON     0.700    0.070     0.700 0.033S 0.018C   E6 TONS     0.27     0.09     0.05     0.08     0.39     0.06      40.  F*

40 D14FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)                        SIZE =      1.2197TONS/YR  ZAVE=    0.0410
     0.830      LB/TON     0.070    0.002     0.070 0.030S 0.075C   E6 TONS     1.47     0.44     1.56     0.04     0.09     0.03      60.

52 B01SECONDARY COPPER PLANT  (BLAST)                                  SIZE =      5.7564TONS/YR  ZAVE=    0.0180
     0.820      LB/TON     0.780    0.078     0.780 0.035S 0.014C   E6 TONS     0.40     0.14     0.36     0.13     0.15     0.09      60.

44 D12PERIODIC KILN (COAL FIRED)                                       SIZE =     10.0000TONS/YR  ZAVE=    0.0250
     0.800      LB/TON     1.000    0.300     1.000 0.033S 0.027S   E6 TONS     0.51     0.17     0.14     0.20     0.26     0.17      90.

44 D11PERIODIC KILN (OIL FIRED)                                        SIZE =     10.0000TONS/YR  ZAVE=    0.0250
     0.800      LB/TON     1.000    0.300     1.000 0.033S 0.027S   E6 TONS     2.06     0.67     0.55     0.82     1.04     0.69     340.

43 D12CURING & FIRING  (TUNNEL KILNS-COAL FIRED)                       SIZE =     10.0000TONS/YR  ZAVE=    0.0250
     0.800      LB/TON     1.000    0.300     1.000 0.033S 0.027S   E6 TONS     2.04     0.67     0.55     0.82     1.04     0.69     340.

42 D08CASTABLE REFRACTORY PLANT  (ELECTRIC ARC)                        SIZE =      3.1200TONS/YR  ZAVE=    0.0030
     0.800      LB/TON     2.600    0.130     2.600 0.033S 0.043C   E6 TONS  .  0.48     0.16     0.25     0.50     0.76     0.35     400.

20 A07PHOSPHORIC ACID PLANTS  (WET PROCESS)                            SIZE =     71.3610TONS/YR  ZAVE=    0.1762
     0.810      LB/TON     0.034    0.005     1.000 0.045S 0.123C   E6 TONS    14.90     6.70    32.63     0.20     0.65     0.19     460.

43 D11CURING & FIRING  (TUNNEL KILNS-OIL FIRED)                        SIZE =     10.0000TONS/YR  ZAVE=    0.0250
     0.800      LB/TON     1.000    0.300     1.000 0.033S 0.027S   E6 TONS     6.12     2.02     1.65     2.45     3.11     2.08    1000.

44 D10PERIODIC KILN (GAS FIRED)                                        SIZE =     10.0000TONS/YR  ZAVE=    0.0250
     0.800      LB/TON     1.000    0.300     1.000 0.033S 0.027S   E6 TONS     7.56     2.49     2.04     3.02     3.84     2.57    1300.

47 F03FLUORSPAR  (DRYER)                                               SIZE =     64.6399TONS/YR  ZAVE=    0.0162
     0.800      LB/TON    10.000    0.100    10.000 0.050S 0.044C   E6 TONS     0.50     0.25     0.27     2.00     3.09     1.02    2100.

30 D10ANIMAL FEED DEFLUORINATION                                       SIZE =   4927.4961TONS/YR  ZAVE=    0.0500
     0.900      LB/TON    39.400    0.438   218.000 0.040S 0.0  S   E6 TONS     0.20     0.08     0.0      3.35     3.35     3.22    2100.

40 D10CERAMIC CLAY MFG                                                 SIZE =      1.4400TONS/YR  ZAVE=    0.0036
     0.800      LB/TON     1.000    0.300     1.000 0.033S 0.042S   E6 TONS    13.40     4.42     3.63     5.36     7.61     4.00    2800.
```

*Source categories footnoted by capital letter belong to the same facility and have been aggregated for analysis purposes.

Table A-4. Model IV Minor Source: 1980-1990

TABLE 1

[FOR EXPLANATION OF TERMS SEE PAGE A-7, APPENDIX A]

NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED

RATING	POLLUTANT/SOURCE (1)	K	EMISSION UNITS	(2) EMISSION RATES ALLOWABLE E_S	(3) EMISSION RATES ALLOWABLE E_N	(4) EMISSION RATES UNCONT E_U	(5) GROWTH RATES DECIMAL/YEAR P_B	(6) GROWTH RATES DECIMAL/YEAR P_C	(7) INDUSTRY CAPACITY/PRODUCTION UNITS	SIZE	A	B	C	ZAVE	EMISSIONS 1000 TONS/YEAR T_A	T_S	T_N	TONS/YEAR $T_S - T_N$	
	PARTICULATES																		
20	A20LEAD OXIDES	0.830	LB/TON	0.440	0.440	0.440	0.045S	0.050C	E6 TONS	54.7800TONS/YR	0.77	0.35	0.48	0.3000	0.14	0.23	0.23	★	
10	A02COMMERCIAL BOILERS (0.3-10X10E6 BTU/HR)	0.400	LB/E6 BTU	0.560	0.580	0.800	0.029S	0.043C	E12 BTU	9.8112TONS/YR	32673	9344	17104	0.0613	5790.	5774.	5774.	★	
34	D04COFFEE ROASTING (SPRAY DRYER)	0.850	LB/TON	1.400	1.400	1.400	0.040S	0.0	E6 TONS	4.3435TONS/YR	0.31	0.12	0.0	0.0073	0.16	0.18	0.18	★	A B*
20	A16LITHIUM COMPOUNDS	0.800	LB/TON	0.002	0.000	0.002	0.030S	0.045C	E6 TONS	0.5284TONS/YR	6.80	2.04	3.76	0.7770	0.00	0.01	0.00	4.	
30	D05FISH PROCESSING	0.810	LB/TON	0.400	0.040	0.400	0.008S	0.0 S	E6 TONS	0.4755TONS/YR	0.36	0.03	0.0	0.0029	0.06	0.06	0.05	4.	
50	B08SECONDARY MAGNESIUM SMELTER	0.820	LB/TON	4.000	0.400	4.000	0.035S	0.016S	E6 TONS	0.5740TONS/YR	0.02	0.01	0.00	0.0003	0.03	0.04	0.02	10.	
33	D04COFFEE ROASTING (STONER/COOLER)	0.850	LB/TON	0.722	0.400	1.400	0.040S	0.0	E6 TONS	4.3435TONS/YR	1.55	0.62	0.0	0.0073	0.46	0.48	0.39	60.	A B*
32	D04COFFEE ROASTING (INDIRECT)	0.850	LB/TON	2.160	1.200	4.200	0.040S	0.0	E6 TONS	13.0305TONS/YR	0.78	0.31	0.0	0.0073	0.72	0.72	0.59	130.	B*
30	D19PHARMACEUTICAL	0.830	LB/TON	0.595	0.119	0.595	0.045S	0.090C	E6 TONS	0.1210TONS/YR	0.37	0.17	0.51	0.0005	0.09	0.22	0.18	130.	
30	D03MEAT SMOKEHOUSES	0.810	LB/TON	0.300	0.100	0.300	0.040S	0.018S	E6 TONS	0.3159TONS/YR	3.84	1.54	0.69	0.0026	0.47	0.55	0.37	110.	
31	D04COFFEE ROASTING (DIRECT)	0.850	LB/TON	3.970	2.200	7.600	0.040S	0.0	E6 TONS	23.5790TONS/YR	0.78	0.31	0.0	0.0073	1.32	1.32	1.14	220.	A*
50	D03STEEL FOUNDRIES (INDUCTION)	0.900	LB/TON	0.100	0.0	0.100	0.028S	0.073S	E6 TONS	0.4500TONS/YR	0.29	1.76	4.59	0.0100	0.28	0.49	0.20	290.	
46	F02MICA IND (MINING PART)	0.800	LB/TON	12.000	6.000	12.000	0.050S	0.017C	E6 TONS	38.0159TONS/YR	0.18	0.09	0.03	0.0079	0.69	1.06	0.75	310.	C*
40	D18GLASS MANUFACTURING INDUSTRY (OPAL GLASS)	0.900	LB/TON	2.240	0.022	2.240	0.033S	0.035S	E6 TONS	5.1408TONS/YR	0.54	0.19	0.19	0.0051	0.54	0.73	0.37	370.	
10	E01WASTE OIL BOILERS	0.580	LB/GAL	0.010	0.000	0.010	0.0	0.020C	E6 GAL	1.4500TONS/YR	694.81	0.0	152.16	0.5000	2.01	1.46	2.12	440.	

*Source categories footnoted by capital letter belong to the same facility and have been determined to be a minor source after aggregation.

★Source categories indicate small potential emission reduction or decreasing capacity.

Table A-4. (Cont'd)

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          TABLE  1

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)
                            (2)      (3)       (4)    (5)    (6)                     (7)
                              EMISSION RATES          GROWTH RATES                                                        EMISSIONS
               EMISSION       ALLOWABLE     UNCONT   DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION                1000 TONS/YEAR             TONS/YEAR
RATING K        UNITS       E         E        E       P      P       UNITS          A         B        C        T          T           T        T -T
                            S         N        U       B      C                                               A          S           N          S  N
PARTICULATES

46 FO3MICA IND  (DRYING PART)                                                 SIZE =      38.0159TONS/YR  ZAVE=    0.0079
    0.800       LB/TON     12.000    0.120    12.000 0.0505 0.017C   E6 TONS     0.18      0.09     0.03       0.89      1.06        0.45       610. C*

90 BO1LEAD ACID BATTERY                                                       SIZE =       4.1587TONS/YR  ZAVE=    0.6218
    0.760       LB/TON      0.018    0.000     0.018 0.0455 0.050C   E6 TONS    97.73     43.98    61.46       0.65      1.06        0.37       690.

80 BO2PULPBOARD MFGR.                                                         SIZE =       6.3825TONS/YR  ZAVE=    0.1209
    0.880       LB/TON      0.120    0.006     0.123 0.0315 0.026C   E6 TONS    40.46     12.54    11.74       2.14      2.78        1.56      1200.

40 D15FRIT MFG  (ROTARY FURNACE)                                              SIZE =      25.7032TONS/YR  ZAVE=    0.0036
    0.800       LB/TON      5.800    0.890    17.800 0.0335 0.0375   E6 TONS     0.96      0.32     0.36       2.23      3.05        1.79      1360.

20 C09PAINT MFG.                                                              SIZE =       1.3022TONS/YR  ZAVE=    0.0031
    0.890       LB/TON      1.000    0.001     1.000 0.0675 0.026C   E6 TONS     4.90      3.28     1.43       2.08      2.69        0.69      2000.

20 B20POLYAMIDES                                                              SIZE =      24.1500TONS/YR  ZAVE=    0.0046
    0.700       LB/TON     15.000    0.750    15.000 0.0455 0.150C   E6 TONS     0.19      0.39     0.58       1.06      4.04        0.72      2300.

90 C01GREY IRON FOUNDRIES  (INDUCTION FURNACE)                                SIZE =      41.8500TONS/YR  ZAVE=    0.0600
    0.930       LB/TON      1.500    0.320     1.500 0.0285 0.1305   E6 TONS     4.03      1.13     5.43       2.81      6.63        2.19      4900.

20 A19SODIUM CHLORIDE                                                         SIZE =      38.3535TONS/YR  ZAVE=    0.2690
    0.795       LB/TON      0.386    0.326     0.386 0.0205 0.040C   E6 TONS    73.80     14.76    35.44      10.74     15.89        9.11      6600.

21 A01HYDROCHLORIC ACID INDUSTRY                                              SIZE =      35.8972TONS/YR  ZAVE=    0.0239
    0.860       LB/TON      3.000    0.335     3.500 0.0455 0.070C   E6 TONS     4.03      1.81     3.90       5.20     10.23        2.59      7300.

30 D17DEEP FAT FRYING                                                         SIZE =      18.1699TONS/YR  ZAVE=    0.0038
    0.810       LB/TON      7.130    0.119    11.930 0.0285 0.043C   E6 TONS     3.06      1.02     1.93      10.57     16.18        7.77      8400.

30 D12DIRECT FIRING OF MEATS                                                  SIZE =       4.3274TONS/YR  ZAVE=    0.0000
    0.380   LB/PRD UNT2445.0001594.0002277.000 0.0675 0.071C   E6 PU         0.04      0.02     0.04      16.99     33.78       23.56      9800.

40 C03CONCRETE BATCH PLANT                                                    SIZE =       9.0000TONS/YR  ZAVE=    0.2000
    0.900       LB/TON      0.098    0.010     0.103 0.0335 0.033C   E6 TONS   384.00    126.72   147.29      16.93     23.43       12.58     10900.

10 A01FOSSIL FUEL BOILERS  (<0.3X10E6 BTU/HR)                                 SIZE =       0.0033TONS/YR  ZAVE=    0.0011
    0.230   LB/E6 BTU       0.027    0.018     0.027 0.0675 0.020C  E12 BTU     27100     18157     5935       84.      103.         79.     28600.
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*Source categories footnoted by capital letter belong to the same facility and have been determined to be a minor source after aggregation.

Table A-4. (Cont'd)

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            TABLE  2

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                     (2)     (3)      (4)    (5)    (6)                  (7)
                                EMISSION RATES       GROWTH RATES                                                              EMISSIONS
               EMISSION       ALLOWABLE    UNCONT    DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION               1000 TONS/YEAR             TONS/YEAR
RATING K         UNITS          E       E        E      P      P       UNITS        A        B        C          T         T         T        T -T
                                S       N        U      B      C                                             A         S         N          S  N
SULFUR DIOXIDE

40 D18GLASS MANUFACTURING INDUSTRY  (OPAL GLASS)                   SIZE =     6.1506TONS/YR  %AVE=   0.0091
   0.900        LB/TON       2.680   0.080    2.680 0.0335 0.0335   E6 TONS      0.54     0.18     0.19       0.05      0.08      0.49       430.

10 E01WASTE OIL BOILERS                                            SIZE =    22.7650TONS/YR  %AVE=   0.5000
   0.580        LB/GAL       0.157   0.018    0.157 0.0    0.020C   E6 GAL     694.81     0.0    192.10      31.03     38.56     32.33      9200.

10 A01FOSSIL FUEL BOILERS  (<0.3X10E6 BTU/HR)                      SIZE =     0.0129TONS/YR  %AVE=   0.0011
   0.230      LB/E6 BTU      0.107   0.0      0.107 0.0675 0.020C  E12 BTU     21700    14539     4732       267.      329.       88.    237000.

10 A02COMMERCIAL BOILERS  (0.3-10X10E6 BTU/HR)                     SIZE =    11.4914TONS/YR  %AVE=   0.0613
   0.400      LB/E6 BTU      0.770   0.560    0.937 0.0295 0.043C  E12 BTU     32673     9344    17104      1032.     7869.     6555.  1110000.
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Table A-4. (Cont'd)

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          TABLE  3

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                 (2)     (3)      (4)     (5)     (6)                 (7)
                               EMISSION RATES     GROWTH RATES                                                      EMISSIONS
             EMISSION         ALLOWABLE   UNCONT  DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION            1000 TONS/YEAR          TONS/YEAR
RATING K       UNITS           E       E       E       P       P      UNITS         A        B        C          T        T        T       T -T
                               S       N       U       B       C                                          A        S        N       S  N
NITROGEN OXIDES

10 A02COMMERCIAL BOILERS  (0.3-10X10E6 BTU/HR)                        SIZE =      3.6096TONS/YR  ZAVE=    0.0013
   0.400   LB/E6 BTU    0.235   0.235    0.294 0.0295 0.043C   E12 BTU     32673     9344    17104     1936.    2340.    2340.        *

31 D04COFFEE ROASTING  (DIRECT)                                       SIZE =      0.3102TONS/YR  ZAVE=    0.0073
   0.850      LB/TON    0.100   0.100    0.100 0.0405 0.0       E6 TONS      0.78     0.31     0.0       0.03     0.03     0.03         *

32 D04COFFEE ROASTING  (INDIRECT)                                     SIZE =      0.3102TONS/YR  ZAVE=    0.0073
   0.850      LB/TON    0.100   0.100    0.100 0.0405 0.0       E6 TONS      0.78     0.31     0.0   .   0.03     0.03     0.03         *

40 D10GLASS MANUFACTURING INDUSTRY  (OPAL GLASS)                      SIZE =     17.5567TONS/YR  ZAVE=    0.0051
   0.900      LB/TON    2.040   0.300    7.690 0.0335 0.0335   E6 TONS      0.54     0.18     0.19      0.90     0.07     0.30       273.

10 E01WASTE OIL BOILERS                                               SIZE =      8.7000TONS/YR  ZAVE=    0.5330
   0.580      LB/GAL    0.080   0.039    0.080 0.0    0.020C   E6 GAL     694.81     0.0    152.16     12.09    14.76    13.81       930.

10 A01FOSSIL FUEL BOILERS  (<0.3X10E6 BTU/HR)                         SIZE =      0.0139TONS/YR  ZAVE=    0.0011
   0.230   LB/E6 BTU    0.115   0.097    0.115 0.0675 0.020C   E12 BTU     27100    18157     9035      398.     437.     278.  159610.
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Source categories indicate small potential emission reduction or decreasing capacity.

Table A-4. (Cont'd)

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          TABLE  4

     NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                  (2)      (3)      (4)    (5)    (6)                 (7)
                            EMISSION RATES         GROWTH RATES                                                EMISSIONS
               EMISSION     ALLOWABLE    UNCONT    DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION            1000 TONS/YEAR          T[illegible]/YEAR
RATING K        UNITS        E        E        E      P      P      UNITS      A       B       C          T       T       T          T -T
                             S        N        U      S      C                                    A       S       N          S  N
HYDROCARBONS

20 B15POLYCARBONATES PLANTS                                       SIZE =    1.2320TONS/YR  ZAVE=    0.3280
   0.800     LB/GAL     0.110    0.005     0.110 0.020S 0.105C  E6 GAL    0.08    0.92    0.15     0.00    0.01    0.00         7.

10 B01WASTE OIL BOILERS                                           SIZE =    0.1450TONS/YR  ZAVE=    0.9000
   0.980     LB/GAL     0.001    0.001     0.001 0.0    0.020C  E6 GAL  694.81    0.0   192.16     0.20    0.25    0.28        10.

20 D05POLY-ISOPRENE(IR)                                           SIZE =   48.6000TONS/YR  ZAVE=    0.0270
   0.800     LB/TON     4.500    0.045     4.500 0.033S 0.030C  E6 TONS   0.06    0.03    0.03     0.15    0.21    0.10        60.

30 D03MEAT SMOKEHOUSES                                            SIZE =    0.3685TONS/YR  ZAVE=    0.0028
   0.910     LB/TON     0.350    0.150     0.350 0.040S 0.018S  E6 TONS   3.84    1.54    0.69     0.54    0.04    0.40        80.

20 B18ALKYD                                                       SIZE =    1.8023TONS/YR  ZAVE=    0.0031
   0.080     LB/TON     1.710    0.017     1.710 0.045S 0.019C  E6 TONS   0.97    0.28    0.09     0.33    0.38    0.48       100.

20 B16EPOXY RESIN PLANT (UNMODIFIED)                              SIZE =   16.3200TONS/YR  ZAVE=    0.0204
   0.800     LB/TON     2.000    0.020     2.000 0.020S 0.106C  E6 TONS   0.19    0.04    0.32     0.19    0.41    0.12        70.

20 B14POLYVINYL ALCOHOL PLANTS                                    SIZE =   50.1599TONS/YR  ZAVE=    0.0340
   0.800     LB/GAL     3.300    0.170     3.300 0.020S 0.100C  E6 GAL    0.19    0.03    0.74     0.20    0.51    0.48       540.

90 F04TEXTILE MFG  (TEXTURING)                                    SIZE =   17.9998TONS/YR  ZAVE=    0.0091
   0.860     LB/TON     0.920    0.230     4.000 0.042S 0.092C  E6 TONS   1.03    0.43    1.45     0.41    0.98    0.42       560.

90 F03TEXTILE MFG  (CARPET MFG)                                   SIZE =    3.1304TONS/YR  ZAVE=    0.0091
   0.860     LB/TON     0.720    0.040     0.800 0.042S 0.071C  E6 TONS   2.33    0.96    2.30     0.72    1.43    0.47       760.

20 B20PLASTICS AND RESINS (POLYAMIDES)                            SIZE =   11.2700TONS/YR  ZAVE=    0.0046
   0.700     LB/TON     7.000    0.350     7.000 0.045S 0.150C  E6 TONS   0.19    0.09    0.58     0.47    1.48    0.34      1400.

10 A01FOSSIL FUEL BOILERS  (<0.3X10E6 BTU/HR)                     SIZE =    0.0003TONS/YR  ZAVE=    0.0011
   0.230   LB/E6 BTU    0.003    0.002     0.003 0.067S 0.020C  E12 BTU  27100   16157    5945      6.     11.      7.       3500.

30 D17DEEP FAT FRYING                                             SIZE =   12.0163TONS/YR  ZAVE=    0.0038
   0.810     LB/TON     8.240    0.079     7.870 0.028S 0.043C  E6 TONS   3.66    1.02    1.93     9.25   14.13    6.77      7400.

60 F05P.T.M. ID.  (GAS. BULK PLANTS)(STORAGE & TRANSFER)          SIZE =   60.5274TONS/YR  ZAVE=    0.1737
   0.850     LB/GAL     0.231    0.016     0.820 0.045S 0.0     E6 GAL  458.61  206.37    0.0     44.63   44.43   26.00     19800.

60 B06GRAPHIC ARTS INDUSTRY  (LITHOGRAPHY)                        SIZE =   47.4320TONS/YR  ZAVE=    0.0002
   0.880     LB/TON   700.000   35.000   700.000 0.045S 0.050C  E6 TONS   0.08    0.06    0.05    25.61   41.72   15.47     26700.

64 B03INDUSTRIAL SURFACE COATING  (METAL FURNITURE COATING)       SIZE =   40.5972TONS/YR  ZAVE=    0.0155
   0.820     LB/GAL     5.340    0.064     6.380 0.042S 0.078C  E6 GAL    9.39    3.94   10.51    20.56   43.57   12.30     51300.
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Table A-4. (Cont'd)

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             TABLE  4

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                (2)      (3)      (4)    (5)     (6)                (7)
                           EMISSION RATES        GROWTH RATES                                                      EMISSIONS
               EMISSION    ALLOWABLE   UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION             1000 TONS/YEAR          TONS/YEAR
RATING K        UNITS       E        E        E      P        P      UNITS        A         B        C          T        T          T         T -T
                            S        N        U      B        C                                             A        S          N          S  N
HYDROCARBONS

65 B02INDUSTRIAL SURFACE COATING  (WOOD FURNITURE COATING)         SIZE =      48.9677TONS/YR  ZAVE=     0.0187
    0.820      LB/GAL      5.340    0.320     6.380 0.0425 0.078C   E6 GAL      10.30     4.33    11.53      22.55    47.79    15.10    34600.

60 D03SOLVENT METAL CLEANING  (CONVEYORIZED DEGREASING)            SIZE =      27.0600TONS/YR  ZAVE=     0.0440
    0.820      LB/TON      1.150    0.450     1.500 0.0425 0.040C   E6 TONS    206.00    85.90   100.40      97.13   144.47    91.60    93500.

20 C09PAINT MFG.                                                    SIZE =      39.0659TONS/YR  ZAVE=     0.0031
    0.850      LB/TON     30.000    0.300    30.000 0.0675 0.026C   E6 TONS      4.90     3.28     1.43      62.47    80.76    21.22    59500.

30 D12DIRECT FIRING OF MEATS                                        SIZE =       1.3564TONS/YR  ZAVE=     0.0000
    0.380   LB/PRD UNT6136.000   71.390 7139.000 0.0675 0.071C   E6 PU        0.04     0.02     0.04      42.63    84.65    14.69    69900.

60 D02SOLVENT METAL CLEANING  (OPEN TOP VAPOR DEGREASERS)          SIZE =       9.5325TONS/YR  ZAVE=     0.0155
    0.820      LB/TON      1.150    0.380     1.500 0.0425 0.024C   E6 TONS    375.00   156.37    99.90     176.81   223.92   143.01    80900.

10 A02COMMERCIAL BOILERS  (0.3-10X10E6 BTU/HR)                     SIZE =       0.3213TONS/YR  ZAVE=     0.0613
    0.400   LB/E6 BTU      0.026    0.0       0.026 0.0295 0.043C  E12 BTU     32673     9344    17104       171.     261.     122.   139000.

65 B03INDUSTRIAL SURFACE COATING  (FLATWOOD PRODUCTS)              SIZE =      76.3551TONS/YR  ZAVE=     0.0292
    0.820      LB/GAL      5.340    0.320     6.380 0.0425 0.078C   E6 GAL      44.26    18.59    49.54      96.90   205.36    65.14   140700.

60 F07P.T.M. ID.  (SERVICE STATION UNLOADING)                      SIZE =       1.6893TONS/YR  ZAVE=     0.0083
    0.850      LB/GAL      0.230    0.035     0.477 0.0315 0.035C   E6 GAL      3198      991     1296       313.     439.     249.   190000. D*

60 F06P.T.M. ID.  (SERVICE STATION LOADING)                        SIZE =       1.3989TONS/YR  ZAVE=     0.0063
    0.850      LB/GAL      0.230    0.008     0.395 0.0315 0.035C   E6 GAL      3198      991     1296       313.     439.     223.   216000. D*

60 D01SOLVENT METAL CLEANING  (COLD CLEANERS)                      SIZE =       0.3075TONS/YR  ZAVE=     0.0005
    0.820      LB/TON      1.150    0.260     1.500 0.0425 0.033C   E6 TONS    750.00   312.75   285.67     353.62   468.32   269.95   218000.
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*Source categories footnoted by capital letter belong to the same facility and have been determined to be a minor source after aggregation.

Table A-4. (Cont'd)

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          TABLE  5

   NOTE: 1 IN RATING CCLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                  (2)      (3)       (4)    (5)     (6)                  (7)
                             EMISSION RATES       GROWTH RATES                                                              EMISSIONS
                EMISSION     ALLOWABLE    UNCONT   DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION                     1000 TONS/YEAR          TONS/YEAR
RATING K         UNITS      E        E          E      P       P        UNITS          A        B        C           T         T         T       T -T
                            S        N          U      B       C                                                A       S          N         S  N
CARBON MONOXIDE

10 E01WASTE OIL BOILERS                                                    SIZE =       0.7250TONS/YR  ZAVE=     0.5000
    0.580      LB/GAL      0.005    0.003      0.005 0.0     0.020C    E6 CFT        694.81    0.0   152.16     1.01      1.23      1.15        80.

30 D03MEAT SMOKEHOUSES                                                     SIZE =       0.6318TONS/YR  ZAVE=     0.0026
    0.810      LB/TON      0.600    0.0        0.600 0.040S 0.018S     E6 TONS         3.84     1.54     0.69     0.93      1.10      0.56       540.

10 A01FOSSIL FUEL BOILERS  (<0.3X10E6 BTU/HR)                              SIZE =       0.0048TONS/YR  ZAVE=     0.0011
    0.230    LB/E6 BTU     0.040    0.024      0.040 0.067S 0.020C    E12 BTU       27100    18157     5935     124.      151.      107.     44100.

10 A02COMMERCIAL BOILERS  (0.3-10X10E6 BTU/HR)                             SIZE =       0.7383TONS/YR  ZAVE=     0.0613
    0.400    LB/E6 BTU     0.051    0.0        0.060 0.029S 0.043C    E12 BTU       32673     9344    17104     333.      508.      238.    270000.
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Table A-4. (Cont'd)

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            TABLE  6

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                    (2)     (3)       (4)   (5)     (6)                  (7)
                              EMISSION RATES        GROWTH RATES                                                      EMISSIONS
               EMISSION     ALLOWABLE    UNCONT  DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION            1000 TONS/YEAR            TONS/YEAR
RATING K       UNITS         E       E         E     P      P      UNITS          A        B       C          T        T         T       T -T
                             S       N         U     B      C                                          A        S         N          S  N
LEAD

90 D01TYPE METAL PRODUCTION PLANT                                      SIZE =     0.8883TONS/YR  ZAVE=    0.0000
    1.000      LB/TON      38.800    0.250    39.220 0.045S-0.060S   E6 TONS       0.01    0.01   -0.01     0.22    0.39     0.12       *

90 C01CABLE COVER PROD. PLANT                                          SIZE =     6.2500TONS/YR  ZAVE=    0.0025
    *****      LB/TON       0.500    0.005     0.500 0.005S-0.014C   E6 TONS       0.05    0.00   -0.01     0.12    0.11     0.12       *

90 E01CAN MFG PLANT                                                    SIZE =     0.7053TONS/YR  ZAVE=    0.0006
    0.810      LB/TON       3.110    0.310     3.110 0.040S-0.085C   E6 TONS       0.04    0.01   -0.02     0.04    0.02     0.03       *

20 A20LEAD OXIDES                                                      SIZE =     2.7390TONS/YR  ZAVE=    0.0300
    0.830      LB/TON       0.220    0.220     0.220 0.045S 0.050C   E6 TONS       0.77    0.35    0.48     0.07    0.11     0.11       *

23 A21LEAD PIGMENTS MFGR  (LEAD CHROMEK)                               SIZE =     0.3466TONS/YR  ZAVE=    0.0070
    0.830      LB/TON       0.120    0.120     0.120 0.045S 0.026C   E6 TONS       0.07    0.03    0.02     0.00    0.00     0.00       *

21 A21LEAD PIGMENTS MFGR. (RED LEAD)                                   SIZE =     1.1205TONS/YR  ZAVE=    0.0030
    0.830      LB/TON       0.900    0.900     0.900 0.045S 0.026C   E6 TONS       0.03    0.01    0.01     0.01    0.01     0.01       *

22 A21LEAD PIGMENTS MFGR  (WHITE LEAD)                                 SIZE =     0.0830TONS/YR  ZAVE=    0.0004
    0.830      LB/TON       0.500    0.500     0.500 0.045S 0.026C   E6 TONS       0.00    0.00    0.00     0.00    0.00     0.00       *

50 C01GREY IRON FOUNDRIES  (INDUCTION FURNACE)                         SIZE =     1.3950TONS/YR  ZAVE=    0.0600
    0.930      LB/TON       0.050    0.0       0.050 0.028S 0.136S   E6 TONS       4.03    1.13    5.48     0.09    0.22     0.07     150.

90 B01LEAD ACID BATTERY                                                SIZE =     4.1587TONS/YR  ZAVE=    0.6218
    0.760      LB/TON       0.018    0.000     0.018 0.045S 0.050C   E6 TONS      97.73   43.98   61.46     0.67    1.09     0.38     710.

10 E01WASTE OIL BOILERS                                                SIZE =     2.4650TONS/YR  ZAVE=    0.5000
    0.580      LB/GAL       0.017    0.000     0.017 0.0  S 0.020C   E6 GAL      694.81    0.0   152.16     3.43    4.18     3.43     740.
```

* Source categories indicate small potential emission reduction or decreasing capacity.

Table A-4. (Cont'd)

```
           TABLE  7

   NOTE: 1 IN RATING CCLLMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                       (2)     (3)      (4)    (5)    (6)                     (7)
                                  EMISSION RATES        GROWTH RATES                                                         EMISSIONS
              EMISSION         ALLOWABLE      UNCONT   DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION              1000 TONS/YEAR               TONS/YEAR
RATING K       UNITS           E        E        E       P      P      UNITS          A        B       C          T        T         T       T -T
                               S        N        U       B      C                                            A        S         N         S  N
ACID MIST

90 BOILEAD ACID BATTERY                                                        SIZE =      7.5613TONS/YR  ZAVE=    0.6218
    0.760      LB/TON       0.032    0.000    0.032 0.0455 0.050C  E6 TONS      97.73    43.98   61.46     1.19     1.94      0.65     1300.
```

```
           TABLE  8                       PRIORITY RATING SYSTEM:  1980-1990

   NOTE: 1 IN RATING CCLLMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
     (1)                       (2)     (3)      (4)    (5)    (6)                     (7)
                                  EMISSION RATES        GROWTH RATES                                                         EMISSIONS
              EMISSION         ALLOWABLE      UNCONT   DECIMAL/YEAR   INDUSTRY CAPACITY/PRODUCTION              1000 TONS/YEAR               TONS/YEAR
RATING K       UNITS           E        E        E       P      P      UNITS          A        B       C          T        T         T       T -T
                               S        N        U       B      C                                            A        S         N         S  N
HYDROGEN SULFIDES

30 DOGFISH PROCESSING                                                          SIZE =      0.0689TONS/YR  ZAVE=    0.0029
    0.810      LB/TON       0.038    0.001    0.058 0.0085 0.0     E6 TONS       0.36     0.33    0.0      0.01     0.01      0.01        1.
```

Table A-4. (Cont'd)

```
            TABLE  9

   NOTE: 1 IN RATING COLUMN MEANS NO RATING WAS SPECIFIED
POLLUTANT/SOURCE
    (1)                     (2)      (3)      (4)    (5)     (6)                  (7)
                              EMISSION RATES         GROWTH RATES                                                      EMISSIONS
              EMISSION        ALLOWABLE   UNCONT   DECIMAL/YEAR  INDUSTRY CAPACITY/PRODUCTION              1000 TONS/YEAR              TONS/YEAR
RATING K       UNITS          E        E        E       P       P      UNITS          A        B      C          T          T          T          T -T
                              S        N        U       B       C                                         A          S          N          S  N
FLUORIDES

40 DISFRIT MFG  (ROTARY FURNACE)                                          SIZE =      8.0286TONS/YR  ZAVE=   0.0036
     0.800      LB/TON      5.560    0.060     5.560 0.0335 0.0375   E6 TONS       0.96      0.32      0.36      2.14       2.93       1.43       1500.

40 DIBGLASS MANUFACTURING INDUSTRY  (OPAL GLASS)                          SIZE =     45.8999TONS/YR  ZAVE=   0.0051
     0.900      LB/TON     20.000    2.000    20.000 0.0335 0.0355   E6 TONS       0.54      0.18      0.19      4.86       6.30       3.59       3000.

10 A02COMMERCIAL BOILERS  (0.3-10X10E6 BTU/HR)                            SIZE =      0.0099TONS/YR  ZAVE=   0.0613
     0.400    LB/E6 BTU     0.001    0.000     0.001 0.0295 0.0430  E12 BTU      32673      9344     17104        5.         8.         5.       3100.
```

APPENDIX B

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Table B.4. Major Source Category Growth. B-32

Explanation of Terms Used in Tables B-1 and B-2.

Notation	Explanation
Code	A five-character identifier specifying an unique source category.
K	Maximum capacity utilization rate (K = 1).
A	Industry wide capacity in 1980 (10^6 production units/yr)
Pb	Replacement rate (fraction of 1980 capacity/yr)
Pc	Growth rate (fraction of 1980 capacity/yr)
ZAVE	Hypothetical source of average size (10^6 production units/yr)
PLANTS	Number of new and modified hypothetical average sources.
T	Stack gas exit temperature (°K)
V	Stack gas flow rate (m^3/sec)
H	Stack height (m)
FLG	Three characters XYZ giving the source flags.

X: Mobility flag
M - Mobile source category
N - Non-mobile source category

Y: Flag	Category Air Quality Impact 1980	1990
1	High	High
2	High	Moderate
3	High	Low
4	Moderate	Moderate
5	Moderate	Low
6	Low	Low

PLT	Type of pollutant emitted

PM - Particulates
SO - Sulfur dioxide
NO - Nitrogen dioxide
HC - Hydrocarbons
CO - Carbon monoxide
PB - Lead
FL - Fluorides
HS - Hydrogen Sulfide
AM - Acid Mist

(Continued)

Notation	Explanation
Eu	Uncontrolled emission factor (lb/unit of production)
Es	Emission factor under existing state regulations (lb/unit of production)
En	Emission factor under NSPS (lb/unit of production).
SIZE	Uncontrolled emissions from hypothetical average source operating at full capacity (T/yr)
CAT	Classification of average source based on potential emissions (SIZE) MAJOR - SIZE $\geq$ 100 T/yr MINOR - SIZE < 100 T/yr
Ta	Emissions in 1980 under existing emission limits (Es)(10^3 T/yr)
Ts	Emissions in 1990 under existing emission limits (Es)(10^3 T/yr)
Tn	Emissions in 1990 under NSPS (En)(10^3 T/yr)
Ts-Tn	Maximum potential emissions reduction from NSPS program (T/yr)
(X/AV)s	Normalized air quality impact under existing emission limits (Es)
X	Normalized air quality impact range under existing regulations 0, 1 - High Impact 2 - Moderate Impact 3 - Los Impact
(X/AV)n	Normalized air quality impact under NSPS emission limits (En)
X	Normalized air quality impact range under NSPS 0, 1 - High Impact

Table B-1. Summary of Source Data[a]

```
 CODE             K        A          PB        PC       ZAVE       PLANTS        T          V          H FLG PLT
INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)
10 A03           1.  0.47115E 07     0.03      0.01      1.183        0.0      477.000     15.600     38.100 N4  SO
                                                                                                          N5  NO
                                                                                                          N6  CO
                                                                                                          N4  PM
                                                                                                          N6  HC
                                                                                                          N5  FL
MIXED FUEL BOILERS  (COAL & REFUSE)
10 A06           1.  0.15125E 04     0.04      0.05      0.120        0.0      500.000      3.780     20.000 N5  SO
                                                                                                          N4  NO
                                                                                                          N5  PM
                                                                                                          N5  HC
                                                                                                          N6  CO
                                                                                                          N5  AM
                                                                                                          N5  PM
                                                                                                          N6  SO
                                                                                                          N4  NO
                                                                                                          N5  HC
                                                                                                          N6  CO
MUNICIPAL INCINERATION < 50T/D
10 B03           1.  0.21000E 04     0.04      0.05      0.006        0.0      500.000      3.780     20.000 N5  PM
                                                                                                          N5  SO
                                                                                                          N6  NO
                                                                                                          N6  HC
                                                                                                          N6  CO
                                                                                                          N4  PB
STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)
10 C01           1.  0.11945E 05     0.02      0.09      0.023        0.0      533.000     57.000     15.000 N4  NO
                                                                                                          N5  HC
                                                                                                          N6  CO

                                                                                                          N6  SO
STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)
10 C02           1.  0.59308E 04     0.03      0.03      0.002        0.0      533.000      4.320     12.000 N4  NO
                                                                                                          N5  HC
                                                                                                          N6  CO
```

[a] See page B-2, Appendix B for Definition of terms.

Table B-1. (Cont'd)

```
POLYETHYLENE (HIGH DENSITY)
20 B03         1.  0.12450E 04      0.0       0.12      0.091        0.0      744.000      2.360      18.000 M2  ND
                                                                                                            M2  HC
POLYETHYLENE (LOW DENSITY)
20 B04         1.  0.19984E 04      0.01      0.08      0.145        0.0      744.000      2.360      18.000 M2  HC
                                                                                                            M5  PM
POLYSTYRENE
20 B05         1.  0.11C80E 04      0.06      0.02      0.045        0.0      744.000      2.360      18.000 M5  HC
SYNTHETIC FIBERS INDUSTRY (VISCOSE RAYON)
20 B06         1.  0.19800E 03      0.04      0.0       0.061        0.0      810.000      1.130      22.000 M2  HS
POLYPROPLYENE
20 B07         1.  0.1C725E 04      0.00      0.12      0.101        0.0      744.000      2.360      18.000 M5  PM
                                                                                                            M4  HC
 SYNTHETIC FIBERS INDUSTRY (DACRON POLYESTER)
20 B08         1.  0.95625E 03      0.04      0.10      0.041        0.0      810.000      1.130      22.000 M4  PM
SYNTHETIC FIBER INDUSTRY  (NYLON)
20 B09         1.  0.73600E 03      0.04      0.09      0.040        0.0      810.000      1.130      22.000 M4  HC
                                                                                                            M4  PM
PHENOLIC RESINS
20 B10         1.  0.39480E 03      0.00      0.04      0.197        0.0      744.000      1.930      15.000 M2  HC
UREA-MELAMINE
20 B11         1.  0.31800E 03      0.00      0.04      0.159        0.0      744.000      1.930      15.000 M2  HC
ABS-SAN RESIN PLANT
20 B12         1.  0.31C63E 03      0.00      0.10      0.057        0.0      744.000      1.930      15.000 M5  HC
ACETATE RAYON
20 B13         1.  0.22692E 03      0.04      0.03      0.061        0.0      810.000      1.130      22.000 M2  HC
 CODE          K           A        PB        PC        ZAVE       PLANTS        T          V            H FLG  LT
PLASTICS AND RESINS  (ACRYLIC)
20 B17         1.  0.17839E 03      0.04      0.11      0.002        0.0      811.000      2.360      18.000 M5  HC
POLYESTER RESIN
20 B19         1.  0.34C00E 03      0.04      0.10      0.024        0.0      811.000      2.360      18.000 M5  PM
UREA
20 B21         1.  0.21719E 04      0.03      0.03      0.076        0.0      373.000    667.000      30.500 M6  PM
CARBON BLACK  (FURNACE PROCESS)
20 C03         1.  0.96760E 03      0.04      0.02      0.063        0.0      373.000     30.400      41.000 M3  HC
                                                                                                            M5  CD
                                                                                                            M5  HS
                                                                                                            M5  PM
ACRYLONITRILE PLANTS
20 C06         1.  0.59850E 03      0.04      0.10      0.074        0.0     1143.000     21.410      34.000 M2  HC
                                                                                                            M5  CD
ETHYLENE DICHLORIDE PLANTS  (OXYCHLORINATION PROCESS)
20 C07         1.  0.15490E 04      0.04      0.09      0.322        0.0      477.000      8.160      25.000 M2  HC
                                                                                                            M6  CD
FORMALDEHYDE PLANTS
20 C08         1.  0.38475E 04      0.04      0.09      0.050        0.0      422.000      1.410      15.000 M5  CD
                                                                                                            M3  HC
DETERGENT MANUFACTURING PLANTS
20 C10         1.  0.13365E 04      0.0       0.03      0.004        0.0      322.000     18.880      15.240 M6  PM
VARNISH
20 C15         1.  0.62475E 03      0.07      0.03      0.007        0.0      894.000      0.570      12.200 M2  HC
CHARCOAL PLANTS
20 C16         1.  0.72250E 02      0.02      0.02      0.002        0.0      533.000      0.566       8.000 M2  HC
                                                                                                            M5  CC
```

[a] See page B-2, Appendix B for Definition of terms.

Table B-1. (Cont'd)

```
STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)
10 CO2         1.  0.59508E 04      0.03       0.03       0.002          0.0      533.000      4.320      12,000 N4  SO
INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)
11 B04         1.  0.99950E 04      0.04       0.11       1.017          0.0      700.000      4.720      20,000 N2  PM
                                                                                                                N2  NO
                                                                                                                N1  SO
                                                                                                                N1  HC
                                                                                                                N4  CO
                                                                                                                N2  PB
STATIONERY PIPELINE COMPRESSOR ENGINES
11 C01         1.  0.24975E 04      0.02       0.07       0.004          0.0      750.000     30.000       6.000 N5  NO
                                                                                                                N6  CO
                                                                                                                N6  PM
                                                                                                                N6  SO
INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)
12 B04         1.  0.65120E 03      0.03       0.13       0.011          0.0      550.000      9.440      20,000 N5  NO
                                                                                                                N4  PM
                                                                                                                N6  HC
                                                                                                                N6  CO
ADIPIC ACID PLANTS
20 A04         1.  0.41164E 03      0.01       0.04       0.113          0.0      436.000     13.620      46,000 M3  HC
                                                                                                                M5  CO
                                                                                                                M5  NO
PHOSPHORIC ACID PLANTS  (WET PROCESS)
20 A07         1.  0.6C345E 04      0.04       0.12       0.176          0.0      311.000      4.010      15,240 M2  FL
HYDROFLUORIC ACID PLANTS
20 A08         1.  0.29449E 03      0.04       0.07       0.022          0.0      322.000      2.360      46,000 M2  FL
PHOSPHORIC  ACID PLANTS  (THERMAL PROCESS)
20 A10         1.  0.6C345E 03      0.04       0.01       0.035          0.0      350.000      6.140      15,240 M5  PM
 CODE          K            A       PB         PC         ZAVE         PLANTS        T          V          H FLG  LT
ACETIC ACID  (ACETALDEHYDE)
20 A11         1.  0.18200E 03      0.04       0.08       0.067          0.0     2255.000      3.450      30,480 M5.  HC
                                                                                                                M6.  CO
                                                                                                                M5.  HC
                                                                                                                M3.  HC
                                                                                                                M6.  CO
CYCLOHEXANE
20 A14         1.  0.61605E 03      0.03       0.07       0.124          0.0      302.000      2.420      23.000 M2.  HC
                                                                                                                M5.  CO
BORAX BORIC ACID
20 A15         1.  0.12250E 03      0.03       0.04       0.175          0.0      440.000      2.000      30,000 M2.  PM
HYDROGEN FLUORIDE
20 A17         1.  0.20112E 03      0.03       0.03       0.044          0.0      440.000      2.000      30,000 M4.  PM
POTASH
20 A18         1.  0.26496E 04      0.02       0.03       0.600          0.0      409.000      4.520      22,000 M2.  PM
                                                                                                                M5.  NO
```

[a] See page B-2, Appendix B for Definition of terms.

Table B-1. (Cont'd)

```
                                                                                                      M4  PM
EXPLOSIVE IND (HIGH EXPLCSIVES)
20 C17         1.  0.11952E 04       0.04       0.09       0.037          0.0      310.000      3.000      25.000 M2  SO
                                                                                                      M5  NO
                                                                                                      M1  AM
                                                                                                      M5  PM
EXPLOSIVE IND (LOW EXPLCSIVES)
20 C18         1.  0.33615E 03       0.04       0.09       0.010          0.0      310.000      3.000      25.000 M4  SO
                                                                                                      M6  NO
                                                                                                      M5  PM
                                                                                                      M5  AM
PRINTING INK PLANTS
20 C19         1.  0.22617E 03       0.04       0.05       0.001          0.0      977.000      2.360       9.144 M5  HC
MALEIC ANHYDRIDE
20 C23         1.  0.06320E 02       0.03       0.04       0.020          0.0      314.000      9.170      19.000 M5  CO
                                                                                                      M2  HC
SODIUM CARBONATE PLANT  (NATURAL PROCESS)
20 C24         1.  0.42543E 04       0.04       0.13       0.576          0.0      366.000      7.080      40.000 M6  PM
PHTHALIC ANHYDRIDE PLANTS (NAPTHALENE PROCESS)
20 C25         1.  0.9CC60E 02       0.02       0.0        0.065          0.0      339.000     21.180      61.000 M3  PM
                                                                                                      M5  HC
                                                                                                      M5  CO
PHTHALIC ANHYDRIDE PLANTS  (OXYLENE PROCESS)
20 C26         1.  0.29C09E 03       0.02       0.09       0.065          0.0      339.000     44.430      61.000 M5  CO
                                                                                                      M4  PM
                                                                                                      M4  SO
                                                                                                      M5  HC
TEREPHTHALIC ACID PLANTS
20 C27         1.  0.08595E 03       0.04       0.09       0.147          0.0      339.000     21.180      61.000 M3  HC
DIMETHYL TEREPHTHALATE PLANTS
20 C28         1.  0.12537E 04       0.04       0.09       0.340          0.0      339.000     21.180      61.000 M2  HC
ETHYL BENZENE
20 C30         1.  0.154C0E 04       0.03       0.07       0.770          0.0      440.000      2.000      30.000 M2  HC
ETHYLENE
20 C31         1.  C.82CC0E 04       0.03       0.07       0.550          0.0      397.000      2.540      59.000 M5  SO
                                                                                                      M4  HC
METHANOL PLANTS
20 C32         1.  0.18304E 04       0.03       0.05       0.314          0.0      440.000      2.000      30.000 M2  HC
                                                                                                      M5  CO
PHENOL PLANTS
20 C33         1.  0.0C900E 03       0.03       0.07       0.116          0.0      294.000      2.750      25.600 M2  HC
                                                                                                      M6  CO
METHYL METHACRYLATE PLANTS
20 C34         1.  0.22440E 03       0.03       0.06       0.074          0.0      440.000      2.000      30.000 M2  HC
ETHYLENE GLYCOL DERIVEC FROM ETHYLENE OXIDE
20 C35         1.  0.59200E 03       0.03       0.08       0.150          0.0      440.000      2.000      30.000 M2  HC
                                                                                                      M6  SO
                                                                                                      M6  NO
```

[a] See page B-2, Appendix B for Definition of terms.

Table B-1. (Cont'd)

```
PROPYLENE  (OXIDE)
20 C36         1.  0.583320E 03      0.03       0.06       0.193        0.0      440.000      2.000      30,000 M2  HC
VINYL ACETATE (ETHYLENE)
20 C37         1.  0.370600E 03      0.03       0.09       0.157        0.0      811.000      0.533      30,500 M2  HC
 CODE          K            A        PB         PC         ZAVE       PLANTS        T           V           H FLG  LT
CARBON TETRACHLORIDE (METHANE)
20 C38         1.  0.262400E 03      0.03       0.06       0.065        0.0      440.000      2.000      30,000 M2  HC
CARBON TETRACHLORIDE  (PROPANE)
20 C39         1.  0.183600E 03      0.03       0.06       0.108        0.0      440.000      2.000      30,000 M2  HC
CARBON TETRACHORIDE  (CARBON DISULFIDE)
20 C40         1.  0.147600E 03      0.03       0.06       0.098        0.0      440.000      2.000      30,000 M2  HC
ACETONE (CUMENE)
20 C41         1.  0.316800E 03      0.03       0.06       0.070        0.0      309.000      0.550      26,800 M2  HC
ACETONE  (ISOPROPANOL)
20 C42         1.  0.240400E 03      0.03       0.06       0.068        0.0      309.000      0.550      26,800 M2  HC
ACETONE  (CYANOHYDRIN)
20 C43         1.  0.131200E 03      0.03       0.06       0.150        0.0      309.000      0.550      26,800 M2  HC
METHYL CHLOROFORM
20 C44         1.  0.702400E 02      0.03       0.06       0.017        0.0      440.000      2.000      30,000 M3  HC
STYRENE
20 C45         1.  0.103315E 04      0.04       0.05       0.338        0.0      639.000     28.300      42,000 M6  PM

                                                                                                                M6  ND

                                                                                                                M5  HC
ALLYL CHLORIDE
20 C46         1.  0.548000E 02      0.02       0.04       0.057        0.0      440.000      2.000      30,000 M3  HC
ACRYLIC ACID
20 C47         1.  0.240000E 03      0.03       0.06       0.080        0.0      440.000      2.000      30,000 M2  HC

                                                                                                                M5  CO
ACETIC ANHYDRIDE
20 C48         1.  0.504000E 03      0.03       0.06       0.109        0.0      311.000      0.142      27,430 M2  HC

                                                                                                                M5  CO

                                                                                                                M6  PM
CYCLOHEXANOL/CYCLOHEXANONE
20 C49         1.  0.344800E 03      0.03       0.06       0.085        0.0      299.000      3.040      27,500 M2  HC

                                                                                                                M5  CO
SYNTHETIC RUBBER INC.  (STYRENE-BUTADIENE)(SBR)
20 D01         1.  0.699150E 03      0.0        0.0        0.148        0.0       89.400      1.416      24,400 M5  PM

                                                                                                                M4  HC
POLY-BUTADIENE
20 D02         1.  0.187990E 03      0.03       0.05       0.041        0.0      810.000      0.850      10,000 M2  HC
ETHYLENE-PROPYLENE
20 D08         1.  0.134400E 03      0.03       0.12       0.052        0.0      810.000      0.850      10,000 M2  HC
SYTHETIC RUBBER  (NEOPRENE)
20 D07         1.  0.110800E 03      0.03       0.05       0.073        0.0      810.000      0.850      10,000 M2  HC
ETHYLENE OXIDE PLANTS  (AIR OXIDATION PROCESS)
21 C11         1.  0.835200E 03      0.08       0.04       0.097        0.0      422.000     16.280      15,000 M2  HC
AMMONIA PLANTS
21 C13         1.  0.977340E 04      0.04       0.03       0.167        0.0      783.000      6.950      32,000 M5  HC
FUEL CONVERSION HIGH BTU COAL GASIFICATION
21 C20         1.  0.443470E 04      0.0        0.20       7.884        0.0      644.000     79.500      45,700 M4  SO

                                                                                                                M2  HC
ETHYLENE OXIDE PLANTS  (OXYGEN OXIDATION PROCESS)
22 C11         1.  0.413250E 03      0.08       0.04       0.097        0.0      422.000      1.990      15,000 M2  HC
NITRATE FERTILIZER  (AMMONIUM NITRATE) PLANTS
30 A03         1.  0.401700E 04      0.04       0.02       0.122        0.0      338.000      7.080      20,000 M4  PM
                                                                                                                M6  NO
```

[a]See page B-2, Appendix B for Definition of terms.

Table B-1. (Cont'd)

```
COTTON GINNING
30 B01          1.  0.67800E 04     0.04      0.01      0.014       0.0     311.000     4.720     10.000 M4  PM
ALFALFA DEHYDRATING PLANTS
30 D01          1.  0.12100E 04     0.03      0.03      0.062       0.0     380.000    14.160      9.140 M3  PM
WHISKEY
30 D08          1.  0.77367E 06     0.03      0.08     10.380       0.0     894.000     0.472     15.240 M2  PM
                                                                                                   M5  HC
BEER PROCESSING PLANTS
30 D09          1.  0.40909E 04     0.04      0.07      0.043       0.0     894.000     0.472     15.240 M4  PM
                                                                                                   M2  HC
ANIMAL FEED DEFLUORINATION
30 D10          1.  0.90000E 02     0.04      0.0       0.050       0.0     400.000     9.440     10.000 M5  PM
                                                                                                   M1  FL
VEGETABLE OIL MFG.
30 D11          0.  0.34040E 04     0.03      0.03      0.036       0.0     744.000     2.380     18.000 M4  PM
                                                                                                   M2  HC
STARCH MFGR
30 D18          1.  0.19297E 04     0.04      0.02      0.054       0.0     333.000    11.750     23.000 M5  PM
AMMONIUM SULFATE
30 D20          1.  0.67200E 04     0.04      0.12      0.147       0.0     303.000    18.880     25.000 M4  PM
(AGG) FEED AND GRAIN MILL INDUSTRY
30 E01          1.  0.10578E 06     0.04      0.01      0.014       0.0       0.0       0.0        0.0  M4  PM
STONE QUARRYING AND PROCESSING
40 A01          1.  0.57080E 06     0.05      0.03      0.530       0.0     293.000    33.000     10.000 M1  PM
SAND & GRAVEL PROCESS
40 A02          1.  0.49680E 06     0.05      0.0       0.200       0.0     294.000    29.280     10.000 M2  PM
FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)
40 D06          1.  0.19320E 03     0.03      0.07      0.041       0.0     366.000     4.720     12.200 M4  PM
                                                                                                   M1  NO
                                                                                                   M6  CO
                                                                                                   M1  FL
GLASS MANUFACTURING INDUSTRY  (SODA-LIME GLASS)
40 D07          1.  0.91035E 04     0.03      0.03      0.032       0.0     592.000    10.890     33.100 M6  PM
                                                                                                   M6  SO
                                                                                                   M6  NO
(AGG) CASTABLE REFRACTORY PLANTS
40 D08          1.  0.19108E 03     0.03      0.04      0.003       0.0       0.0       0.0        0.0  M1  PM
                                                                                                   M1  FL
CERAMIC CLAY MFG
40 D10          1.  0.53600E 04     0.03      0.04      0.004       0.0     500.000     1.890     10.000 M4  PM
                                                                                                   M6  NO
                                                                                                   M2  FL
GYPSUM MANUFACTURING PLANTS  (CALCINER)
40 D11          1.  0.74880E 04     0.03      0.05      0.129       0.0     408.000    18.970     23.000 M6  PM
PERLITE  (VERTICAL FURNACE)
40 D12          1.  0.31242E 03     0.03      0.04      0.008       0.0     422.000     2.830     15.200 M5  PM
MINERAL WOOL MFG
40 D13          1.  0.37884E 04     0.03      0.02      0.078       0.0     422.000     3.300     15.240 M5  CO
                                                                                                   M4  PM
                                                                                                   M6  SO
```

[a] See page B-2, Appendix B for Definition of terms.

Table B-1. (Cont'd)

```
                                                                                                         M6  NO
MINERAL WOOL MFG
40 D13          1.  0.37884E 04        0.03       0.02     0.078         0.0      422.000     3.300     15.240 M4  HC
FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)
40 D14          1.  0.62475E 03        0.03       0.07     0.041         0.0      366.000     4.720     12.200 M4  PM
                                                                                                         M5  SO
                                                                                                         M4  NO
                                                                                                         M4  HC
                                                                                                         M6  CO
                                                                                                         M2  FL
(AGG) CLAY SINTERING PLANTS
40 D16          1.  0.42000E 03        0.03       0.03     0.184         0.0        0.0       0.0        0.0   N5  PM
FLY-ASH SINTERING  (SINTERING)
40 D17          1.  0.50181E 04        0.03       0.05     1.790         0.0      505.000     7.080     53.340 N2  PM
GLASS MANUFACTURING INDUSTRY  (LEAD GLASS)
40 D19          1.  0.29250E 03        0.03       0.03     0.005         0.0      739.000    10.900     45.700 M6  PM
                                                                                                         M6  SO
                                                                                                         M6  NO
                                                                                                         M5  PB
(AGG) ASPHALT ROOFING PLANTS
41 B01          1.  0.23880E 04        0.04       0.04     0.032         0.0        0.0       0.0        0.0   N4  PM
                                                                                                         N4  HC

                                                                                                         N6  CO
(AGG) PHOSPHATE ROCK PREPARATION PLANTS
41 D01          1.  0.29920E 05        0.05       0.06     0.200         0.0        0.0       0.0        0.0   N4  PM
METALIC MINERALS MINING (IRON ORE)
41 E01          1.  0.13450E 06        0.03       0.03     2.170         0.0      297.000     9.440     10.000 N4  PM
(AGG) NON-METALLIC MINING - CLAY
41 F01          1.  0.80000E 01        0.05       0.04     0.559         0.0        0.0       0.0        0.0   N1  PM
METALIC MINERALS MINING (FERROALLOY)
42 E01          1.  0.16785E 04        0.03       0.01     0.028         0.0      297.000    14.160     10.000 N2  PM
                                                                                                         N2  PB
(AGG) NON-METALLIC MINING - GYPSUM
42 F01          1.  0.68560E 04        0.05       0.03     0.194         0.0        0.0       0.0        0.0   N2  PM
METALIC MINERALS MINING (COPPER)
43 E01          1.  0.12792E 05        0.03       0.07     1.000         0.0      297.000     9.440     10.000 N2  PM
(AGG) NON-METALLIC MINING - LIME
43 F01          1.  0.14196E 05        0.03       0.05     0.270         0.0        0.0       0.0        0.0   N1  PM
METALIC MINERALS MINING (LEAD MINING)
44 E01          1.  0.41670E 04        0.03       0.01     0.030         0.0      297.000     9.440     10.000 N4  PM
                                                                                                         N4  PB
PHOSPHATE ROCK (MINING)
44 F01          1.  0.91360E 05        0.05       0.04     5.180         0.0      294.000     1.000     10.000 N1  PM
(AGG) TUNNEL KILNS(GAS),DRYERS AND STORAGE
45 D10          1.  0.91600E 04        0.03       0.03     0.025         0.0        0.0       0.0        0.0   N4  PM
                                                                                                         N6  NO
                                                                                                         N6. HC
                                                                                                         N6. CO
                                                                                                         N1. FL
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[a] See page B-2, Appendix B for Definition of terms.

Table B-1. (Cont'd)

```
(AGG) TUNNEL KILNS(OIL),DRYERS AND STORAGE
45 D11         1.  0.24400E 04      0.03     0.03    0.025      0.0     0.0      0.0      0.0  N4  PM
                                                                                            N6  SO
                                                                                            N6  NO
                                                                                            N6  HC
                                                                                            N1  FL
(AGG) TUNNEL KILNS(COAL),DRYERS AND STORAGE
45 D12         1.  0.80000E 03      0.03     0.03    0.025      0.0     0.0      0.0      0.0  N4  PM
                                                                                            N5  SO
                                                                                            N6  NO
                                                                                            N6  HC

                                                                                            N6  CO
                                                                                            N1  FL
METALIC MINERALS MINING (ZINC MINE & CRUSHING)
45 E01         1.  0.40140E 04      0.03     0.01   30.000      0.0   297.000   14.160   10.000 N4  PM
                                                                                            N4  PB
(AGG) NON-METALLIC MINING - BORON COMPOUNDS
45 F01         1.  0.78960E 03      0.05     0.09    0.261      0.0     0.0      0.0      0.0  N1  PM
(AGG) PERIODIC KILNS(GAS),DRYERS AND STORAGE
46 D10         1.  0.30800E 04      0.03     0.03    0.025      0.0     0.0      0.0      0.0  N4  PM
(AGG) PERIODIC KILNS(GAS),DRYERS AND STORAGE
                                                                                            N6  NO
                                                                                            N6  HC
                                                                                            N6  CO
                                                                                            N1  FL
(AGG) PERIODIC KILNS(OIL), DRYERS AND STORAGE
46 D11         1.  0.80000E 03      0.03     0.03    0.025      0.0     0.0      0.0      0.0  N4  PM
                                                                                            N6  SO
                                                                                            N6  NO
                                                                                            N6  HC
                                                                                            N1  FL
(AGG) PERIODIC KILNS(COAL),DRYERS AND STORAGE
46 D12         1.  0.20000E 03      0.03     0.03    0.025      0.0     0.0      0.0      0.0  N4  PM
                                                                                            N5  SO
                                                                                            N6  NO
                                                                                            N6  HC
                                                                                            N6  CO
                                                                                            N1  FL
METALIC MINERALS MINING (ALUMINUM)
46 E01         1.  0.15300E 04      0.03     0.04    0.030      0.0   297.000    9.440   10.000 N5  PM
METALIC MINERALS MINING (URANIMUN)
47 E01         1.  0.42515E 04      0.03     0.10    1.000      0.0   297.000    9.440   10.000 N3  PM
(AGG) NON-METALLIC MINING - FLUORSPAR
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[a] See page B-2, Appendix B for Definition of terms.

Table B-1. (Cont'd)

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47 F01          1.  0.2CC40E 03        C.05       0.04       0.016         0.0        0.0        0.0         0.0 M2.  PM
                                                                                                                M2.  FL
BY-PRODUCT COKE OVEN
50 A10          1.  0.36861E 05        0.03       0.01       0.720         0.0    550.000      4.720      37.700 M1   PM

                                                                                                                M2   HC
                                                                                                                M1   SO
                                                                                                                M4   NO
                                                                                                                M4   CO
GREY IRON FOUNDRIES  (ELECTRIC ARC)
50 C02          1.  0.28737E 04        0.03       0.14       0.090         0.0    500.000      4.720      10.000 M3   PM
                                                                                                                M3   PB
GREY IRON FOUNDRIES  (REVERBERATORY)
50 C03          1.  0.25110E 03        0.03       0.14       0.060         0.0    500.000      4.720      10.00C M3   PM
                                                                                                                M3   PB
GREY IRON FOUNDRIES  (CLPOLA)
50 C04          1.  0.62496E 04        0.0       -0.02       0.090         0.0    675.000      9.430      20.000 M5   PM
                                                                                                                M5   CO
                                                                                                                M2   PB
STEEL FOUNDRIES  (ELECTRIC ARC)
50 D01          1.  0.84870E 04        0.03       0.07       0.030         0.0    482.000     11.320      20.00C M5   PM
                                                                                                                M6   NO
STEEL FOUNDRIES  (OPEN HEARTH)
50 D02          1.  0.283C5E 04        0.03       0.07       0.090         0.0    500.000      7.080      20.00C M5   PM
                                                                                                                M6.  NO
URANINUM REFINING
50 F01          1.  0.11857E 05        0.03       0.01       0.116         0.0    500.000      9.440      10.000 M5.  PM
(AGG) SECONDARY ALUMINUM PLANTS
51 B12          1.  0.33374E 03        0.04       0.02       0.016         0.0        0.0        0.0         0.0 M2.  PM
(AGG) SECONDARY ZINC SMELTERS (RETORT REDUCTION & KETTLE FURNACES)
51 E01          1.  0.12300E 03        0.03       0.02       0.008         0.0        0.0        0.0         0.0 M4.  PM
(AGG) SECONDARY ZINC SMELTERS (RETORT REDUCTION & KETTLE FURNACES)
                                                                                                                M4   PB
                                                                                                                M2   FL
(AGG) SECONDARY ZINC SMELTERS (HORIZ & REVERB FURNACES)
51 E02          1.  0.12300E 03        0.03       0.02       0.008         0.0        0.0        0.0         0.0 M4   PM
                                                                                                                M4   PB
                                                                                                                M2   FL
PESTICIDES MANUFACTURING
55 A01          1.  0.53950E 03        0.04       0.07       0.050         0.0    293.000      9.440      10.00C M2   PM
(AGG) SECONDARY COPPER PLANTS (BLAST FURNACE)
57 B01          1.  0.16400E 03        0.03       0.01       0.018         0.0        0.0        0.0         0.0 M5   PM
(AGG) SECONDARY COPPER PLANTS (BLAST FURNACE)
57 B01          1.  0.16400E 03        0.03       0.01       0.018         0.0        0.C        0.0         0.0 M2   SO
 CODE           K          A           PB         PC         ZAVE        PLANTS         T          V           H FLG  LT
(AGG) SECONDARY COPPER PLANTS (BLAST FURNACE)
57 B01          1.  0.164C0E 03        0.03       0.01       0.018         0.0        0.0        0.0         0.0 M2   FL
(AGG) SECONDARY COPPER PLANTS (CONVERTER SMELTING)
58 B01          1.  0.22960E 03        0.03       0.01       0.018         0.0        0.0        0.0         0.0 M6.  SO
(AGG) SECONDARY COPPER PLANTS (CONVERTER SMELTING)
58 B01          1.  0.22960E 03        0.03       0.01       0.018         0.0        0.0        0.0         0.0 M4.  PM
DRY CLEANING
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[a] See page B-2, Appendix B for Definition of terms.

Table B-1. (Cont'd)

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60 B01          1.  0.15600E 04      0.05        0.01      0.000         0.0      452.000     3.060      10.000 N2  HC
GRAPHIC ARTS INDUSTRY  (GRAVURE)
60 B04          1.  0.68693E 02      0.04        0.05      0.001         0.0      644.000     1.180      10.000 N2  HC
GRAPHIC ARTS INDUSTRY  (FLEXOGRAPHY)
60 B05          1.  0.29894E 02      0.04        0.05      0.000         0.0      644.000     1.880      10.000 N2  HC
GRAPHIC  ARTS INDUSTRY  (LETTERPRESS)
60 B07          1.  0.64200E 02      0.04        0.05      0.000         0.0      644.000     1.880      10.000 N4  HC
P.T.M. ID.  (SHIP & BARGE TRANSFER, GAS. & CRUDE OIL)
60 F03          1.  0.92208E 06      0.03        0.04     34.640         0.0      294.000     0.444      15.000 N1  HC
P.T.M. ID.  (BULK GAS. TERMINALS) LOADING TANK TRUCKS/RR CAR
60 F04          1.  0.14327E 06      0.08        0.03      1.220         0.0      727.000     0.472      22.000 N4  HC
INDUSTRIAL SURFACE COATING  (LARGE APPLIANCE COATING)
61 B02          1.  0.79991E 04      0.04        0.08      0.065         0.0      386.000    18.880      17.500 N5  HC
INDUSTRIAL SURFACE COATING  (MAGNET WIRE COATING)
61 B03          1.  0.60839E 04      0.04        0.08      0.071         0.0      644.000     0.472      25.000 N5  HC
INDUSTRIAL SURFACE COATING  (AUTOMOBILES)
62 B02          1.  0.19383E 05      0.04        0.03      0.655         0.0     3859.000   337.000      25.000 N5  HC
INDUSTRIAL SURFACE COATING  (CAN COATING)
62 B03          1.  0.11203E 06      0.04        0.08      7.780         0.0      393.000    15.570      17.000 N2  HC
INDUSTRIAL SURFACE COATING  (METAL COILS COATING)
63 B02          1.  0.63796E 04      0.04        0.08      0.277         0.0      644.000     0.944      25.000 N2  HC
INDUSTRIAL SURFACE COATING  (PAPER COATING)
63 B03          1.  0.82935E 05      0.04        0.08      5.913         0.0      644.000     0.944      25.000 N1  HC
INDUSTRIAL SURFACE COATING  (FABRIC COATING)
64 B02          1.  0.21279E 05      0.04        0.08      0.224         0.0      344.000    20.880      17.000 N2  HC
GASOLINE ADDITIVES  (SODIUM-LEAD)
70 F01          1.  0.89C42E 02      0.04       -0.10      0.060         0.0      300.000     3.000      30.000 M1  PB
GASOLINE ADDITIVES  (ELECTROLYTIC)
70 F02          1.  0.77436E 01      0.04       -0.10      0.022         0.0      300.000     0.432      30.000 M1  PB
(AGG) PETROLEUM REFINERY MISC. SOURCES
71 D01          1.  0.29C70E 07      0.02        0.04     21.490         0.0        0.0       0.0         0.0  N1  HC
(AGG) CRUDE OIL AND NATURAL GAS PRODUCTION PLANTS
71 E01          1.  0.14632E 06      0.03        0.03      0.639         0.0        0.0       0.0         0.0  N6  HC

                                                                                                                N1  SD
CHEMICAL WOOD IND.  (NSSC)
80 A03          1.  0.27580E 04      0.03        0.05      0.081         0.0      373.000     2.890       9.140 M2  SD
CHEMICAL WOOD PULPING IND.  (ACID SULFITE)
80 A04          1.  0.12474E 04      0.03        0.0       0.088         0.0      373.000     2.890       9.140 M2  SD

--                                                                                                              M4  PM
PLYWOOD MANUFACTURING PLANT
80 B01          1.  0.14688E 08      0.05        0.05    151.240         0.0      373.000     2.890      10.000 M2  PM

                                                                                                                M4  HC
 CODE           K            A       PB          PC        ZAVE        PLANTS        T         V             H FLG  LT
TEXTILE MFG (HEAT SETTING/FINISHING)
90 F02          1.  0.5C740E 03      0.04        0.08      0.009         0.0      644.000     9.440      15.000 M4  HC
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Table B-2. Summary of Source-Pollutant Data

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POLLUTANT IS PM
CODE       EU       ES       EN        SIZE              TA        TS        TN      TS-TN    X/AV S         X/AV N  X

 GREY IRON FOUNDRIES  (CUPOLA)
50 C04     17.00     1.77     0.20    711.4490         11.06      9.07     10.84   -1766.   0.3810E-01  2   0.4310E-02  3
 SYNTHETIC RUBBER IND.  (STYRENE-BUTADIENE) (SBR)
20 D01      0.70     0.70     0.12     30.5620          0.49      0.49      0.49       0.   0.1870E-01  2   0.3200E-02  3
 INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)
10 A03      2.77     0.40     0.40    737.3035       1902.97   2186.81   2186.81       0.   0.2690E-01  2   0.2690E-01  2
 STONE QUARRYING & PROCESSING
40 A01     17.30     2.60     2.60   3459.9966       1484.08   1973.82   1973.82       0.   0.3100E 01  1   0.3100E 01  1
 CERAMIC CLAY MFG
40 D10    180.00    18.00    18.00    259.1995         96.48    137.00    137.00       0.   0.1120E 00  2   0.1120E 00  2
 FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)
40 D06      4.80     4.40     4.40     82.6559          0.85      1.63      1.63       0.   0.2080E 00  2   0.2080E 00  2
 FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)
40 D14     99.20     9.30     9.30   1728.5591          5.81     11.97     11.97       0.   0.4450E 00  2   0.4450E 00  2
 ACETIC ANHYDRIDE
20 C48      0.01     0.01     0.0       0.4380          0.01      0.01      0.0        5.   0.7160E-02  3   0.7160E-03  3
 STYRENE
20 C45      0.04     0.04     0.0       6.0840          0.07      0.11      0.05      70.   0.8220E-03  3   0.8220E-04  3
 ANIMAL FEED DEFLUORINATION
30 D10    625.00     4.57     0.06  14062.4883          0.41      0.41      0.25     160.   0.2330E 00  2   0.3190E-02  3
 GLASS MANUFACTURING INDUSTRY  (LEAD GLASS)
40 D19     24.00     1.89     0.24     55.0799          0.55      0.75      0.42     330.   0.9000E-03  3   0.1140E-03  3
 CHEMICAL WOOD PULPING IND.  (ACID SULFITE)
80 A04     24.00     3.00     2.00    700.1270          3.74      3.74      3.36     390.   0.4700E 00  2   0.3140E 00  2
 CHARCOAL PLANTS
20 C16    400.00    19.50     4.00    310.2493          1.41      1.76      1.22     540.   0.1670E 00  2   0.3440E-01  2
 DETERGENT MANUFACTURING PLANTS
20 C10     90.00     1.50     0.45    157.5449          2.00      2.83      2.25     580.   0.4010E-02  3   0.1200E-02  3
 EXPLOSIVE IND (LOW EXPLOSIVES)
20 C18     19.00     1.55     0.38     81.8463          0.52      1.28      0.53     750.   0.3130E-01  2   0.7660E-02  3
 PHOSPHORIC  ACID PLANTS  (THERMAL PROCESS)
20 A10    134.00     2.27     0.13   1917.3582          1.37      1.58      0.80     780.   0.6880E-01  2   0.4060E-02  3
 STATIONARY PIPELINE COMPRESSOR ENGINES
11 C01      1.18     1.18     0.83      2.1240          2.95      5.10      4.29     810.   0.5690E-03  3   0.4030E-03  3
 PERLITE  (VERTICAL FURNACE)
40 D12     21.00     4.35     0.21     54.5873          1.36      1.85      1.00     850.   0.2750E-01  2   0.1330E-02  3
 STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)
10 C02      5.41     5.41     5.14      3.6085         32.19     41.21     40.23     980.   0.9120E-02  3   0.8660E-02  3
 SYNTHETIC FIBER INDUSTRY  (NYLON)
20 B09     15.00     1.53     0.75    239.9999          1.13      2.64      1.61    1000.   0.4950E-01  2   0.2430E-01  2
 POLYETHYLENE (LOW DENSITY)
20 B04      0.45     0.45     0.04     28.2858          0.90      1.98      0.96    1000.   0.4110E-01  2   0.4110E-02  3
 INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)
12 B04    108.00     6.47     5.40    520.9915          4.47     10.20      8.99    1200.   0.1950E-01  2   0.1620E-01  2
 MINERAL WOOL MFG.
40 D13     32.40     4.27     3.63   1032.1653         16.18     19.41     18.22    1200.   0.2940E 00  2   0.2500E 00  2
 CARBON BLACK  (FURNACE PROCESS)
20 C03    200.00     3.10     1.10   5165.9922          3.00      3.84      2.43    1400.   0.1770E-01  2   0.6390E-02  3
 ALFALFA DEHYDRATING PLANTS
30 D01     23.60     2.06     0.24    368.3958          2.49      3.52      1.97    1500.   0.5790E-01  2   0.6630E-02  3
 PHTHALIC ANHYDRIDE PLANTS  (NAPTHALENE PROCESS)
20 C25     99.00    99.00     0.99   3052.0662          8.92      8.92      7.15    1800.   0.8840E 00  1   0.8840E-02  3
 HYDROGEN FLUORIDE
20 A17     14.40    14.40     1.01    254.0159          2.90      4.09      2.17    1900.   0.4040E 00  2   0.2830E-01  2
 BORAX BORIC ACID
20 A15     23.20    23.20     1.62   1989.3982          2.84      4.21      2.14    2100.   0.3160E 01  1   0.2210E 00  2
 DACRON POLY.
20 B08      7.00     1.58     0.35    107.6250          1.51      3.92      1.51    2400.   0.4920E-01  2   0.1090E-01  2
 STARCH MFGR
30 D18      8.00     2.00     0.02    179.2799          3.86      4.61      2.15    2500.   0.4930E-01  2   0.4930E-03  3
 EXPLOSIVE IND (HIGH EXPLOSIVES)
20 C17     26.00     1.55     0.26    396.4241          1.85      4.39      1.58    2800.   0.1110E 00  2   0.1860E-01  2
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Table B-2. (Cont'd)

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 NITRATE FERTILIZER  (AMMONIUM NITRATE) PLANTS
30 A05     12.72    1.64    0.18    708.4014        6.59     7.91     4.39     3800.   0.1560E 00  2   0.1710E-01  2
 GREY IRON FOUNDRIES  (REVERBERATORY)
50 C03     10.00   10.00    0.10    278.9998        2.51     5.93     1.85     4100.   0.8520E 00  1   0.8520E-02  3
 POLYESTER RESIN
20 B19      7.00    7.00    0.35     57.1199        2.38     6.17     1.55     4600.   0.7990E-01  2   0.4000E-02  3
 URANIUM REFINING
50 F01      1.00    1.00    0.01     49.3000       11.86    13.28     8.58     4700.   0.6750E-01  2   0.6750E-03  3
 STEEL FOUNDRIES  (OPEN HEARTH)
50 D02     11.00    2.20    0.22    445.4998        6.23    10.77     5.11     5700.   0.6980E-01  3   0.6980E-02  3
 COTTON GINNING
30 B01     12.00    2.09    0.48     81.6000       14.13    15.97     9.96     6000.   0.1060E 00  2   0.2440E-01  2
 POLYPROPYLENE
20 B07      3.00    2.67    0.03    118.1698        2.86     8.89     2.85     6000.   0.1530E 00  2   0.1720E-02  3
 UREA
20 B21      6.80    6.80    1.36    191.2159       14.77    19.85    12.24     7600.   0.5060E-02  3   0.1010E-02  3
 MIXED FUEL BOILERS  (OIL & REFUSE)
10 A07     20.00    5.00    0.20    599.9988        9.37    13.69     6.04     7600.   0.2620E 00  2   0.1050E-01  2
 PESTICIDES MANUFACTURING
55 A01     10.10   10.00    0.10    209.5749        5.39    10.61     3.04     7600.   0.3160E 01  1   0.3160E-01  2
 MIXED FUEL BOILERS  (COAL & REFUSE)
10 A06     30.00    5.00    0.30    917.9988        9.56    13.96     6.32     7600.   0.1890E 00  2   0.1120E-01  2
 GYPSUM MANUFACTURING PLANTS  (CALCINER)
40 D11     90.00    1.51    0.10   4633.1914       11.31    16.85     8.57     8300.   0.3350E-01  2   0.2220E-02  3
 SODIUM CARBONATE PLANT  (NATURAL PROCESS)
20 C24     90.00    1.16    0.45  22534.7266        4.93    16.46     8.05     8430.   0.2040E 00  2   0.7900E-01  2
 PHTHALIC ANHYDRIDE PLANTS (O-XYLENE PROCESS)
20 C26    240.00   24.00    2.40   7398.9414        6.96    16.48     6.66     9800.   0.1240E 00  2   0.1240E-01  2
 METALLIC MINERALS MINING  (ZINC MINE & CRUSHING)
45 E01      7.00    7.00    0.70     94.5000       28.10    31.47    21.35    10100.   0.6380E 03  1   0.6380E 02  1
 BEER PROCESSING PLANTS
30 D05      5.45    2.09    0.27     95.1545        8.55    16.82     6.64    10200.   0.1910E 00  2   0.2470E-01  2
 METALIC MINERALS MINING (LEAD MINING)
44 E01      7.00    7.00    0.70     94.5000       29.17    32.96    22.20    10800.   0.8650E 00  1   0.8650E-01  2
 MUNICIPAL INCINERATION < 50T/D
10 B03     30.00    6.47    0.30     52.4999       13.59    19.84     8.82    11000.   0.1390E-01  2   0.6430E-03  3
 GLASS MANUFACTURING INDUSTRY  (SODA-LIME GLASS)
40 D07      2.21    1.89    0.02     52.1485       17.21    23.06    11.66    11400.   0.1350E-01  2   0.1570E-03  3
 METALIC MINERALS MINING (FERROALLOY)
42 E01     15.10   15.10    0.60    190.2599       25.35    29.15    17.76    11400.   0.1290E 01  1   0.5110E-01  2
 METALLIC MINERALS MINING  (ALUMINUM)
46 E01     11.10   11.10    0.11    149.8499       16.98    24.63    12.35    12300.   0.1370E 01  1   0.1360E-01  2
 POTASH
20 A18      9.47    9.47    0.66   2207.4556       25.09    33.72    21.02    12700.   0.2850E 01  1   0.1980E 00  2
 VEGETABLE OIL MFG.
30 D11     63.00    8.63    0.63   1036.6143       29.38    37.31    22.33    15000.   0.2060E 00  2   0.1510E-01  2
 FLY-ASH SINTERING  (SINTERING)
40 D17    110.00    4.00    1.10  84666.9375       20.07    34.29    19.18    15100.   0.1010E 01  1   0.2790E 00  2
 METALLIC MINERALS MINING  (IRON ORE)
41 E01      0.70    0.70    0.50    683.5491       94.15   121.46   106.12    15300.   0.6260E 01  1   0.4470E 01  1
 STEEL FOUNDRIES  (ELECTRIC ARC)
50 D01     13.00    2.20    0.26    175.4999       18.67    32.30    15.67    16600.   0.1830E-01  3   0.2160E-02  3
 AMMONIUM SULFATE
30 D20     20.00    2.04    1.00   1234.7981       13.71    41.08    23.98    17100.   0.1980E 00  2   0.9690E-01  2
 WHISKEY
30 D06      0.04    0.03    0.0     214.9697       21.64    34.63    16.27    18400.   0.7220E 00  1   0.5690E-01  2
 GREY IRON FOUNDRIES  (ELECTRIC ARC)
50 C02      7.00    7.00    0.07    292.9495       20.12    47.47    14.81    32700.   0.8950E 00  1   0.8950E-02  3
 PLYWOOD MANUFACTURING PLANT
80 D01      0.13    0.0     0.0    9083.4570       58.75    92.12    50.08    42000.   0.1250E 01  1   0.4050E 00  2
 METALIC MINERALS MINING (URANIUM)
47 E01     11.00   11.00    0.11   3024.9993       46.77    93.53    34.27    59300.   0.2770E 02  1   0.2770E 00  2
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Table B-2. (Cont'd)

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 BY-PRODUCT COKE OVEN
50 A10       5.00     5.00     0.21    1673.9993          184.30    202.73    135.71     67000.   0.9050E 00  1   0.3890E-01  2
 METALLIC MINERALS MINING (COPPER)
43 E01       7.10     7.10     0.07    3017.4993           90.83    154.41     62.85     91600.   0.2760E 02  1   0.2720E 00  2
 INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)
11 B04       6.47     6.47     0.06      20.8981           62.08    176.27     39.26    137000.   0.1010E 01  1   0.1020E-01  2
 SAND & GRAVEL PROCESS
40 A02       1.90     1.90     0.42     151.9999          867.92    867.92    529.89    338000.   0.8410E 00  1   0.1860E 00  2
 PHOSPHATE ROCK (MINING)
44 F01      12.00    12.00     6.00   24863.9844         1096.32   1578.70   1063.43    515000.   0.1550E 04  1   0.7750E 03  1
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Table B-2. (Cont'd)

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POLLUTANT IS SU
 CODE       EU      ES      EN       SIZE              TA       TS       TN       TS-TN    X/AV S     X   X/AV N     X
 PHTHALIC ANHYDRIDE PLANTS (O-XYLENE PROCESS)
20 C26      9.40    9.40    9.40    289.7915          2.73     6.46     6.46         0.   0.1990E-01  2  0.1990E-01  2
 INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)
11 B04      2.38    2.38    2.38      7.6874         22.84    64.84    64.84         0.   0.2700E 00  2  0.2700E 00  2
 ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE
20 C35      0.05    0.05    0.0       3.0000          0.03     0.04     0.02        20.   0.1960E-02  3  0.1570E-03  3
 MINERAL WOOL MFG.
40 D13      0.02    0.02    0.0       0.6371          0.08     0.09     0.05        40.   0.7300E-03  3  0.7300E-03  3
 STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)
10 C01      0.02    0.02    0.0       0.1682          0.30     0.56     0.24       320.   0.1440E-04  3  0.1440E-04  3
 GLASS MANUFACTURING INDUSTRY  (LEAD GLASS)
40 D19      2.68    2.68    0.08      6.1506          0.78     1.06     0.54       520.   0.5240E-03  3  0.1570E-04  3
 STATIONERY PIPELINE COMPRESSOR ENGINES
11 C01      5.27    5.27    5.00      9.4860         13.16    22.77    22.14       630.   0.1700E-02  3  0.1620E-02  3
 MIXED FUEL BOILERS  (OIL & REFUSE)
10 A07      1.30    1.30    0.01     38.9999          2.44     3.56     1.50      2100.   0.2800E-01  2  0.2160E-03  3
 STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)
10 C02     16.80   16.80   16.00     11.2056         99.97   127.97   125.06      2900.   0.2120E-01  2  0.2020E-01  2
 FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)
4C D14      4.49    4.49    0.0      78.2382          2.81     5.78     1.97      3800.   0.1550E 00  2  0.1730E-03  3
 MUNICIPAL INCINERATION < 50T/D
10 B03      2.50    2.50    0.03      4.3750          5.25     7.66     3.26      4400.   0.2570E-02  3  0.3080E-04  3
 MIXED FUEL BOILERS  (COAL & REFUSE)
10 A06     14.00   14.00    0.14    419.9993         26.25    38.32    16.24     22100.   0.2520E 00  2  0.2520E-02  3
 CHEMICAL WOOD PULPING IND.  (ACID SULFITE)
80 A04     61.00   61.00    3.10   1779.4900         76.09    76.09    53.70     22400.   0.7170E 01  1  0.3650E 00  2
 GLASS MANUFACTURING INDUSTRY  (SODA-LIME GLASS)
40 D07      4.02    4.02    0.12     94.8585         36.60    49.04    25.25     23800.   0.1610E-01  2  0.4820E-03  3
 BY-PRODUCT COKE OVEN
50 A10      5.75    5.75    4.02   1925.0989        211.95   233.14   238.91     24200.   0.4280E 00  2  0.2990E 00  2
 EXPLOSIVE IND (LOW EXPLOSIVES)
20 C18     69.40   69.40    5.55    298.9539         23.33    57.29    16.39     40900.   0.5750E 00  1  0.4600E-01  2
 FUEL CONVERSION H BTU COAL GASIFICATION
21 C20      6.42    6.42    1.56  18980.7188         28.47    85.41    42.31     43100.   0.4990E 00  2  0.1210E 00  2
 ETHYLENE
20 C31      4.73    4.73    0.01   1066.6143         38.79    79.94    27.12     52600.   0.4040E 00  2  0.1270E-02  3
 INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)
10 A03      1.90    1.53    1.50    505.7317       7208.59  8283.80  8216.07     67700.   0.4900E-01  2  0.4830E-01  2
 CHEMICAL WOOD IND.  (NSSC)
80 A03     61.00   61.00    3.10   2333.7366        168.24   248.99   122.84    126000.   0.9410E 01  1  0.4780E 00  2
 EXPLOSIVE IND (HIGH EXPLOSIVES)
20 C17     75.00   75.00    6.00   1143.5315         89.64   220.13    62.97    157000.   0.2200E 01  1  0.1760E 00  2
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Table B-2. (Cont'd)

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POLLUTANT IS CO
CODE        EU       ES       EN        SIZE               TA        TS        TN       TS-TN      X/AV S     K   X/AV N     K
 GREY IRON FOUNDRIES  (CUPOLA)
50 C04    250.00  250.00    8.00   10462.4922         1562.40   1281.17   1553.80   -272233.   0.9340E-01  2  0.2990E-02  3
 BY-PRODUCT COKE OVEN
50 A10      2.67    2.67    2.67     893.9148           98.42    108.26    108.26         0.   0.8770E-02  3  0.8870E-02  3
 FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)
40 D06      2.03    2.03    2.03      34.9566            0.39      0.75      0.75         0.   0.1760E-02  3  0.1760E-02  3
 ACETIC ACID  (BUTANE)
20 A13      4.40    4.40    0.04     403.9197            0.81      0.81      0.81         0.   0.3840E-02  3  0.3840E-04  3
 INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)
11 B04      8.47    8.47    8.47      27.3581           81.27    230.76    230.76         0.   0.2430E-01  2  0.2430E-01  2
 MUNICIPAL INCINERATION < 50T/D
10 B03     35.00   35.00   35.00      61.2499           73.50    107.31    107.31         0.   0.1380E-02  3  0.1380E-02  3
 MIXED FUEL BOILERS  (OIL & REFUSE)
10 A07     17.00   17.00   17.00     509.9993           31.87     46.54     46.54         0.   0.1640E-01  2  0.1640E-01  2
 MIXED FUEL BOILERS  (COAL & REFUSE)
10 A06     18.00   18.00   18.00     539.9993           33.75     49.27     49.27         0.   0.1240E-01  2  0.1240E-01  2
 FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)
40 D14      2.26    2.26    2.24      39.3804            1.41      2.91      2.89        20.   0.1990E-02  3  0.1970E-02  3
 INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)
12 B04      0.05    0.05    0.0        0.2412            0.03      0.08      0.02        60.   0.2500E-05  3  0.2500E-05  3
 PHENOL PLANTS
20 C33      0.48    0.48    0.0       24.3252            0.29      0.60      0.21       390.   0.5160E-02  3  0.5380E-04  3
 ACETIC ACID  (ACETALDEHYDE)
20 A11      4.04    4.04    0.04     108.2719            0.74      1.59      0.45      1100.   0.1030E-02  3  0.1020E-04  3
 PHTHALIC ANHYDRIDE PLANTS  (NAPTHALENE PROCESS)
20 C25    100.00  100.00    1.00    3082.8943            9.01      9.01      7.22      1800.   0.1640E-01  2  0.1640E-03  3
 ETHYLENE DICHLORIDE PLANTS  (OXYCHLORINATION PROCESS)
20 C07      1.30    1.30    0.01     144.5066            2.01      4.77      1.14      3600.   0.1570E-02  3  0.1570E-04  3
 ACRYLIC ACID
20 C47     24.00   24.00    0.24     767.9993            5.76     10.32      4.09      6200.   0.2240E-01  2  0.2240E-03  3
 CHARCOAL PLANTS
20 C16    320.00  320.00    3.20     248.1996           23.12     28.90     17.61     11300.   0.5050E-01  2  0.5050E-03  3
 ACETIC ANHYDRIDE
20 C48     21.90   21.90    0.22     959.2188           11.04     19.77      7.85     11900.   0.2880E 00  2  0.2880E-02  3
 METHANOL PLANTS
20 C32     10.00   10.00    0.10    1255.9993           18.30     29.82     12.98     16800.   0.3670E-01  2  0.3670E-03  3
 CYCLOHEXANE
20 A14     25.00   25.00    0.25    1400.6228           15.40     30.30     10.98     19300.   0.2140E 00  2  0.2140E-02  3
 ADIPIC ACID PLANTS
20 A04    115.00  115.00    0.11    5587.8438           47.37     70.12     39.80     30300.   0.2770E-01  2  0.2770E-04  3

 CYCLOHEXANOL/CYCLOHEXANONE
20 C49    111.47  111.47    1.11    3812.2698           38.43     68.83     27.32     41500.   0.4900E 00  2  0.4900E-02  3
 STATIONARY PIPELINE COMPRESSOR ENGINES
11 C01     29.35   29.35    9.64      52.8299           73.30    126.81     81.03     45800.   0.2600E-03  3  0.8510E-04  3
 INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)
10 A03      0.03    0.03    0.0        8.5708          151.71    174.34    101.65     72700.   0.3940E-04  3  0.3940E-04  3
 MALEIC ANHYDRIDE
20 C23   1560.00 1340.00   15.60   12479.9922           89.14    137.11     61.27     73800.   0.4540E 00  2  0.5290E-02  3
 FORMALDEHYDE PLANTS
20 C08     15.67   15.67    0.16     352.5745           60.29    148.05     34.31    114000.   0.2690E-01  2  0.2700E-03  3
 PHTHALIC ANHYDRIDE PLANTS (O-XYLENE PROCESS)
20 C26    301.00  301.00    3.01    9279.5039           87.32    206.71     71.22    135000.   0.2850E-01  2  0.2850E-03  3
 MINERAL WOOL MANUFACTURING
40 D13     94.40   94.40    4.72    3007.2981          357.62    429.15    262.68    166000.   0.1200E 00  2  0.5990E-02  3
 ACRYLONITRILE PLANTS
20 C06    159.00  159.00    8.00    5315.4414           95.16    246.82     62.12    185000.   0.1510E-01  2  0.7600E-03  3
 STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)
10 C02     54.80   54.80    0.0       36.5515          326.10    417.41    218.49    199000.   0.1130E-02  3  0.1130E-02  3
 STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)
10 C01     42.80   42.80    0.0      287.9080          511.25    956.04    409.30    547000.   0.8280E-03  3  0.8280E-03  3
 CARBON BLACK  (FURNACE PROCESS)
20 C03   2800.00 2800.00    2.80   72323.8750         2709.28   3468.09   1492.08   1980000.   0.2940E 00  2  0.2940E-03  3
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Table B-2. (Cont'd)

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POLLUTANT IS NO
CODE          EU      ES      EN        SIZE            TA        TS        TN        TS-TN    X/AV S     X    X/AV N     X
 STEEL FOUNDRIES  (OPEN HEARTH)
50 D02       0.01    0.01    0.01      0.4050          0.03      0.05      0.05          0.   0.1900E-03  3   0.1900E-03  3
 FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)
40 D06      22.60   22.60   22.60    389.1709          4.37      8.35      8.35          0.   0.6170E 00  1   0.6170E 00  1
 STEEL FOUNDRIES  (ELECTRIC ARC)
50 D01       0.20    0.20    0.20      2.7000          1.70      2.94      2.94          0.   0.9980E-03  3   0.9980E-03  3
 ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE
20 C35       0.13    0.13    0.01      7.8000          0.08      0.11      0.06         50.   0.1350E-02  3   0.1040E-03  3
 STYRENE
20 C45       0.05    0.05    0.0       7.6050          0.08      0.14      0.06         80.   0.4260E-03  3   0.3410E-04  3
 BY-PRODUCT COKE OVEN
50 A10       0.06    0.06    0.05     19.0836          2.10      2.31      2.21        100.   0.1890E-02  3   0.1650E-02  3
 MINERAL WOOL MFG.
40 D13       0.16    0.16    0.08      5.0971          0.61      0.73      0.58        150.   0.4670E-02  3   0.2340E-02  3
 NITRATE FERTILIZER  (AMMONIUM NITRATE) PLANTS
30 A05       0.13    0.13    0.0       6.9615          0.50      0.60      0.28        320.   0.3270E-02  3   0.7850E-04  3
 POTASH
20 A18       0.36    0.36    0.02     83.9159          0.95      1.28      0.80        480.   0.3120E-01  2   0.2170E-02  3
 FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)
40 D14       2.42    2.42    1.57     42.1684          1.51      3.12      2.39        720.   0.6680E-01  2   0.4340E-01  2
 CERAMIC CLAY MFG
40 D10       0.40    0.40    0.20      0.5760          2.14      3.04      2.24        800.   0.1490E-02  3   0.7450E-03  3
 GLASS MANUFACTURING INDUSTRY  (LEAD GLASS)
40 D19       7.65    7.65    0.38     17.5567          2.24      3.02      1.57       1400.   0.1080E-02  3   0.5370E-04  3
 MIXED FUEL BOILERS  (OIL & REFUSE)
10 A07      34.50   15.00   13.80   1014.9988         28.12     41.06     19.15       1900.   0.2110E 00  2   0.1950E 00  2
 ADIPIC ACID PLANTS
20 A04      53.60   12.00    1.61   2604.4219          4.94      7.32      4.57       2700.   0.3530E-01  2   0.4740E-02  3
 MUNICIPAL INCINERATION < 50T/D
10 B03       3.00    3.00    1.05      5.2500          6.30      9.20      5.72       3500.   0.2470E-02  3   0.8630E-03  3
 GLASS MANUFACTURING INDUSTRY  (SODA-LIME GLASS)
40 D07       7.14    2.04    0.36    168.4800         18.57     24.89     14.64      10200.   0.6550E-02  3   0.1160E-02  3
 INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)
12 B04      15.00   15.00    0.15     72.3600         10.37     23.64      6.91      16700.   0.2710E-01  2   0.2710E-03  3
 EXPLOSIVE INC (LOW EXPLOSIVES)
20 C18      30.00   30.00    2.10    129.2309         10.08     24.76      6.89      17900.   0.3510E-01  2   0.2450E-02  3
 INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)
11 B04       1.87    1.87    0.65      6.0401         17.94     50.95     24.85      26100.   0.1700E 00  2   0.5900E-01  2
 POLYETHYLENE (HIGH DENSITY)
20 B03      22.50   22.50   11.25   1023.7488         28.01     86.23     57.12      29100.   0.6230E 00  1   0.3120E 00  2
 MIXED FUEL BOILERS  (COAL & REFUSE)
10 A06      15.00   35.00    5.25    449.9993         65.62     95.81     48.40      47400.   0.5030E 00  1   0.7550E-01  2
 INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)
10 A03       0.64    0.41    0.36    170.3519       1936.43   2225.25   2121.41     104000.   0.1050E-01  2   0.9350E-02  3
 STATIONARY PIPELINE COMPRESSOR ENGINES
11 C01      60.50   60.50   15.13    108.8999        151.10    261.40    156.02     105000.   0.1560E-01  2   0.3910E-02  3
 STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)
10 C02     179.00  179.00  123.00    119.3929       1065.19   1363.44   1160.17     203000.   0.1810E 00  2   0.1240E 00  2
 EXPLOSIVE INC (HIGH EXPLOSIVES)
20 C17     128.00  128.00    6.40   1951.6277        152.99    375.68     98.72     277000.   0.5300E 00  1   0.2650E-01  2
 STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)
10 C01     230.00  230.00  131.00   1547.1724       2747.37   5137.58   3872.24    1270000.   0.1060E 00  2   0.6060E-01  2
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Table B-2. (Cont'd)

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POLLUTANT IS HC
CODE        EU      ES      EN       SIZE             TA        TS        TN         TS-TN     X/AV S     K    X/AV N     K
 SYNTHETIC RUBBER IND.  (STYRENE-BUTADIENE) (SBR)
20 D01      4.20    4.20    3.10     183.3719         2.94      2.94      2.94          0.     0.1500E 00  2   0.1110E 00  2
 ACETIC ACID  (BUTANE)
20 A13     14.70   14.70    0.15    1349.4595         2.70      2.70      2.70          0.     0.9370E 00  1   0.9370E-02  3
 INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)
11 D04      2.88    2.88    2.88       9.3024        27.63     78.46     78.46          0.     0.6040E 00  1   0.6040E 00  1
 TEXTILE MFG  (HEAT SETTING/FINISHING)
90 F02     15.80    4.74    4.74      61.8253         2.41      5.24      5.24          0.     0.1550E-01  2   0.1550E-01  2
 PHTHALIC ANHYDRIDE PLANTS  (NAPTHALENE PROCESS)
20 C25     10.00   10.00    0.10     308.2891         0.90      0.90      0.72        180.     0.1200E 00  2   0.1230E-02  3
 ACETONE  (CYANOHYDRIN)
20 C43      2.00    2.00    0.02     119.9999         0.30      0.54      0.21        330.     0.1960E 01  1   0.1960E-01  2
 MUNICIPAL INCINERATION < 50T/D
10 B03      0.22    0.22    0.01       0.3850         0.46      0.67      0.30        370.     0.6330E-03  1   0.2080E-04  3
 INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)
12 B04      0.60    0.60    0.0        2.8944         0.41      0.95      0.27        680.     0.2190E-02  1   0.2193E-02  1
 POLYPROPYLENE
20 B07     23.60    0.59    0.24     929.6023         0.63      1.97      1.15        810.     0.4530E-01  2   0.1810E-01  2
 ALLYL CHLORIDE
20 C46     20.00   20.00    0.20     459.9998         1.10      1.70      0.89        820.     0.9810E 00  1   0.9810E-02  3



 UREA-MELAMINE
20 B11      7.50    5.76    0.07     476.9993         1.83      2.71      1.75        960.     0.9820E 00  1   0.1280E-01  2
 MIXED FUEL BOILERS  (OIL & REFUSE)
10 A07      0.91    0.91    0.28      27.3000         1.71      2.49      1.50       1000.     0.6410E-01  2   0.2013E-01  2
 ACETATE BATCH
20 B13      7.00    7.00    0.15     198.5549         1.59      2.03      0.93       1100.     0.5390E 00  1   0.2703E-01  2
 FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)
40 D14     13.05    3.39    2.10     227.3962         2.12      4.37      3.27       1100.     0.2180E 00  2   0.1353E 01  2
 PHTHALIC ANHYDRIDE PLANTS (O-XYLENE PROCESS)
20 C26      2.40    2.40    0.02      73.9894         0.70      1.65      0.57       1100.     0.1660E-01  2   0.1380E-01  1
 PHENOLIC RESINS
20 B10      7.50    5.76    0.07     590.9993         2.27      3.37      2.18       1200.     0.1220E 01  1   0.1583E-01  2
 MIXED FUEL BOILERS  (COAL & REFUSE)
10 A06      0.90    0.90    0.0       27.0000         1.69      2.46      1.03       1400.     0.4520E-01  2   0.4523E-01  2
 POLY-BUTADIENE
20 D02      9.00    9.00    0.09     153.1350         1.69      2.76      1.15       1600.     0.1060E 01  1   0.1363E-01  2
 WHISKEY
30 D08      0.0     0.0     0.0       13.6082         2.14      3.43      1.50       1900.     0.9580E-01  2   0.1910E-02  1
 ACETONE (CUMENE)
20 C41      7.21    7.21    0.07     201.5914         2.28      4.09      1.62       2500.     0.3290E 01  1   0.3283E-01  2
 METHYL CHLOROFORM
20 C44     36.00   36.00    0.36     250.5598         2.53      4.53      1.80       2700.     0.5350E 00  1   0.5350E-02  3
 ACETIC ACID  (METHANOL)
20 A12     15.00   15.00    0.15     569.9993         1.66      4.31      1.36       3000.     0.3960E 00  2   0.3963E-02  3
 STYRENE
20 C45      1.64    1.64    0.02     249.4436         2.71      4.63      1.66       3000.     0.4520E-01  2   0.4523E-03  3
 ABS-SAN RESIN PLANT
20 B12      7.50    5.76    0.07     174.3524         1.79      4.81      1.74       3100.     0.3590E 00  2   0.4670E-02  3
 ACETONE  (ISOPROPANOL)
20 C42     13.00   13.00    0.13     353.5994         3.13      5.60      2.22       3400.     0.5770E 01  1   0.5773E-01  2
 PHENOL PLANTS
20 C33      4.48    4.48    0.04     227.0351         2.73      5.62      1.95       3700.     0.3520E 01  1   0.3523E-01  2
 POLYSTYRENE
20 B05     11.70    4.20    0.12     209.1959         4.65      5.58      1.26       4300.     0.1460E 00  2   0.4180E-02  3
 TOBACCO MANUFACTURING PLANT
80 B01      0.0     0.0     0.0       21.3324         4.55      7.14      2.52       4600.     0.1250E 00  2   0.1250E 00  2
 CARBON TETRACHORIDE  (CARBON DISULFIDE)
20 C40     32.00   32.00    0.32    1250.5591         4.72      8.46      3.36       5100.     0.2670E 01  1   0.2673E-01  2
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Table B-2. (Cont'd)

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 ACETIC ACID  (ACETALDEHYDE)
20 A11     19.62   19.62    0.20     525.8152               3.57      7.71       2.20       5500.   0.3650E 00  2   0.3650E-02  3
 CARBON TETRACHLORIDE  (PROPANE)
20 C39     32.00   32.00    0.32    1382.3987               5.24      9.38       3.72       5700.   0.2950E 01  1   0.2950E-01  2
 INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)
10 A03      0.0     0.0     0.0        0.7320              12.96     14.89       8.68       6200.   0.2410E-03  1   0.2410E-03  3
 AMMONIA PLANTS
21 C13      0.90    0.90    0.0       68.3086               8.80     12.29       5.41       6900.   0.3420E-01  2   0.3420E-01  2
 MALEIC ANHYDRIDE
20 C23    262.00  147.00    2.62    2095.9988               9.78     15.04       6.99       8000.   0.3640E 01  1   0.6490E-01  2
 SYNTHETIC FIBER INDUSTRY  (NYLON)
20 B05      7.00    7.00    0.35     111.9999               5.15     12.09       3.10       8800.   0.3040E 00  2   0.1520E-01  2
 ACETIC ANHYDRIDE
20 C48     17.80   17.80    0.18     779.6392               8.97     16.07       6.38       9700.   0.1710E 02  1   0.1710E 00  2
 ETHYL BENZENE
20 C30      5.00    5.00    0.05    1539.9993               7.70     15.15       5.49       9700.   0.3290E 01  1   0.3290E-01  2
 POLYETHYLENE (LOW DENSITY)
2C B04     24.20    4.20    0.24    1521.1497               8.39     18.46       8.49      10000.   0.5150E 00  1   0.2940E-01  2
 CARBON TETRACHLORIDE (METHANE)
20 C38     36.00   36.00    0.36     930.2388               9.45     16.92       6.72      10200.   0.1980E 01  1   0.1980E-01  2
 PRINTING INK PLANTS
20 C19    120.00   48.00    4.80      42.5292              10.86     17.68       7.14      10500.   0.5540E-01  2   0.5540E-02  3
 ADIPIC ACID PLANTS
20 A04     42.70   42.70    0.04    2074.7913              17.59     26.04      14.78      11300.   0.7520E 00  1   0.7570E-01  3


 P.T.B. ID.  (BULK GAS. TERMINALS) LOADING TANK TRUCKS/RR CAR
60 F04      0.36    0.07    0.0      185.1043              10.17     14.29       2.66      11600.   0.2020E 00  2   0.1023E-01  2
 SYNTHETIC RUBBER  (NEOPRENE)
20 D07    120.00  120.00    1.20    3635.3965              13.30     21.66       9.04      12600.   0.2520E 02  1   0.2520E 00  2
 ETHYLENE
20 C31      1.49    1.49    0.33     335.9944              12.22     25.18      12.24      12900.   0.4150E 00  2   0.9200E-01  2
 ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE
20 C35     34.90   34.90    0.35    2093.9976              20.66     29.14      14.61      14500.   0.4470E 01  1   0.4470E-01  2
 CYCLOHEXANE
20 A14     20.00   20.00    0.20    1120.4983              12.32     24.24       8.78      15500.   0.1250E 02  1   0.1250E 00  2
 CHARCOAL PLANTS
20 C16    484.00  484.00    4.80     375.4021              34.97     43.71      27.09      16600.   0.5580E 01  1   0.5530E-01  2
 METHANOL PLANTS
20 C32     10.00   10.00    0.10    1255.9993              18.30     29.82      12.98      16800.   0.2680E 01  1   0.2680E-01  2
 POLYETHYLENE (HIGH DENSITY)
20 B03     59.20    7.40    0.59    2693.5979               9.21     28.36      10.74      17600.   0.6570E 00  1   0.5240E-01  2
 VARNISH
20 C15     67.90   34.90    0.68     191.3251              21.80     28.27       7.61      20700.   0.7370E 00  1   0.1433E-01  2
 INDUSTRIAL SURFACE COATING  (MAGNET WIRE COATING)
61 B03      2.32    2.32    0.06      67.9156              14.07     29.81       8.77      21000.   0.3540E 00  2   0.9930E-02  3
 ETHYLENE OXIDE PLANTS  (OXYGEN OXIDATION PROCESS)
22 C11     43.00   43.00    0.43    1807.8362              17.77     26.30       3.78      22500.   0.7780E 01  1   0.7780E-01  2
 ETHYLENE-PROPYLENE
20 D06     72.00   72.00    0.72    1497.5994               9.68     30.05       6.72      23100.   0.1040E 02  1   0.1040E 00  2
 TEREPHTHALIC ACID PLANTS
20 C27     20.77   20.77    0.21    1299.3689              14.25     33.73       8.10      25600.   0.5050E 00  1   0.5100E-02  3
 VINYL ACETATE (ETHYLENE)
20 C37     43.03   43.03    0.43    2871.1741              15.95     37.75      11.43      26300.   0.1010E 02  1   0.1010E 00  2
 METHYL METHACRYLATE PLANTS
20 C34    112.80  112.80    1.13    3347.9014              25.31     45.33      17.99      27300.   0.7140E 01  1   0.7140E-01  2
 PROPYLENE  (OXIDE)
20 C36     59.20   59.20    0.59    4567.8672              34.53     61.83      24.54      37300.   0.9750E 01  1   0.9750E-01  2
 CYCLOHEXANOL/CYCLOHEXANONE
20 C49    100.68  100.68    1.01    3443.2522              34.71     62.17      24.68      37500.   0.3240E 02  1   0.3240E 00  2
 FUEL CONVERSION H BTU COAL GASIFICATION
21 C20      5.17    5.17    0.68   15285.0859              22.93     68.78      28.96      39800.   0.1310E 01  1   0.1730E 00  2
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Table B-2. (Cont'd)

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 GRAPHIC ARTS INDUSTRY  (FLEXOGRAPHY)
60 B05   1300.00 1300.00   26.00     247.1036           38.81     63.22     22.18      41000.   0.1060E 01  1   0.2120E-01  2
 VEGETABLE OIL MFG.
30 D11     38.00   37.90   15.20     625.2588          129.01    163.84    121.35      42500.   0.1220E 01  1   0.4880E 00  2
 ACRYLIC ACID
20 C47    173.77  173.77    1.74    5560.6289           41.70     74.69     29.65      45000.   0.1190E 02  1   0.1190E 00  2
 GRAPHIC  ARTS INDUSTRY  (LETTERPRESS)
60 B07    700.00  700.00   35.00      53.0560           44.94     73.20     27.14      46100.   0.2270E 00  2   0.1140E-01  2
 FORMALDEHYDE PLANTS
20 C08      6.42    6.42    0.06     144.4499           24.70     60.66     14.05      46600.   0.8050E 00  1   0.8030E-02  3
 P.T.M. ID.  (SHIP & BARGE TRANSFER, GAS. & CRUDE OIL)
60 F03      0.07    0.07    0.0      986.3728           61.78     92.33     45.56      46800.   0.6190E 02  1   0.1200E 01  1
 INDUSTRIAL SURFACE COATING  (METAL COILS COATING)
63 B02      6.48    5.34    0.32    7363.0508           34.07     72.20     22.90      49300.   0.1880E 01  1   0.1130E 00  2
 ETHYLENE DICHLORIDE PLANTS  (OXYCHLORINATION PROCESS)
20 C07     53.90   19.60    0.54    5991.4609           30.36     71.88     18.22      53700.   0.1720E 01  1   0.4750E-01  2
 BEER PROCESSING PLANTS
30 D09     10.90   10.90    0.11     190.3090           44.59     87.71     27.36      60300.   0.1340E 01  0   0.1340E-01  2
 INDUSTRIAL SURFACE COATING  (LARGE APPLIANCE COATING)
61 B02      6.48    5.34    0.06     174.0202           42.72     90.52     25.58      64900.   0.1160E 00  2   0.1410E-02  3
 CARBON BLACK  (FURNACE PROCESS)
20 C03    100.00  100.00    0.10    2582.9976           96.76    123.86     53.29      70600.   0.7680E 00  1   0.7680E-03  3
 INDUSTRIAL SURFACE COATING  (AUTOMOBILES)
62 B02      6.10    5.34    0.31    1845.7063          103.51    137.76     64.55      73200.   0.2900E-01  2   0.1680E-02  3
 BY-PRODUCT COKE OVEN
50 A10      5.98    5.98    0.04    2002.1028          220.43    242.47    159.29      83200.   0.1450E 01  1   0.1020E-01  2



 DIMETHYL TEREPHTHALATE PLANTS
20 C28     37.00   37.00    0.37    5346.4922           46.39    109.82     26.36      83500.   0.2080E 01  1   0.2080E-01  2
 GRAPHIC ARTS INDUSTRY  (GRAVURE)
60 B04   1300.00 1300.00   65.00     324.3235           89.30    145.46     53.93      91500.   0.1970E 01  1   0.9850E-01  2
 PLASTICS AND RESINS  (ACRYLIC)
20 B17    240.00  240.00    2.40     219.2399           42.80    121.54     24.52      97000.   0.4110E 00  2   0.4110E-02  3
 ACRYLONITRILE PLANTS
20 C06    142.00   91.00    7.92    4747.1250           54.46    141.26     39.64     102000.   0.6310E 00  1   0.5500E-01  2
 STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)
10 C02     31.30   31.30    0.0       20.8771          186.26    238.41    124.79     114000.   0.4710E-01  2   0.4710E-01  2
 INDUSTRIAL SURFACE COATING  (FABRIC COATING)
64 B02      6.48    5.34    0.26     594.3252          113.63    240.81     74.42     166000.   0.5380E 00  1   0.2620E-01  2
 ETHYLENE OXIDE PLANTS  (AIR OXIDATION PROCESS)
21 C11    168.00  168.00    1.68    7063.1758          140.31    207.70     29.86     178000.   0.5970E 01  1   0.5970E-01  2
 DRY CLEANING
60 B01    508.70  258.00   24.40      70.0250          402.48    440.20    223.84     216000.   0.1450E 00  2   0.1370E-01  2
 INDUSTRIAL SURFACE COATING  (PAPER COATING)
63 B03      6.48    5.34    0.26   15709.6406          442.87    938.56    290.06     649000.   0.4020E 02  1   0.1960E 01  1
 STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)
10 C01     56.00   56.00    0.0      376.7024          668.93   1250.89    535.14     716000.   0.7910E-01  2   0.7910E-01  2
 INDUSTRIAL SURFACE COATING  (CAN COATING)
62 B03      4.79    4.79    0.05   15279.1289          536.64   1137.27    319.87     817000.   0.1420E 02  1   0.1480E 00  2
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Table B-2. (Cont'd)

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POLLUTANT IS PB
 CODE         EU      ES      EN          SIZE         TA      TS      TN      TS-TN   X/AV S      X  X/AV N      X

  GREY IRON FOUNDRIES (CUPOLA)
 50 C04       0.60    0.60    0.03     25.1100         3.75    3.07    3.72     -641.  0.8270E 00  1  0.4140E-01  2
  GASOLINE ADDITIVES  (SODIUM-LEAD)
 70 P01      89.40   10.78    0.89   1930.3953         0.96    0.34    0.51     -174.  0.6060E 01  1  0.5000E 00  1
  GASOLINE ADDITIVES  (ELECTROLYTIC)
 70 P02      32.20    4.10    1.00    249.3437         0.03    0.01    0.02       -5.  0.2180E 01  1  0.5320E 00  1
  GREY IRON FOUNDRIES  (REVERBERATORY)
 50 C03       0.07    0.07    0.0       1.9530         0.02    0.04    0.01       30.  0.3820E 00  2  0.6110E 00  1
  METALIC MINERALS MINING (ZINC MINE & CRUSHING)
 45 E01       0.10    0.10    0.01   1349.9983         0.40    0.45    0.31      140.  0.3720E 03  1  0.3720E 02  1
  METALIC MINERALS MINING (LEAD MINING)
 44 E01       0.10    0.10    0.01      1.3500         0.42    0.47    0.32      150.  0.3720E 00  2  0.3720E-01  2
  METALLIC MINERALS MINING (FERROALLOY)
 42 E01       0.30    0.30    0.0       3.7800         0.50    0.58    0.35      230.  0.1040E 01  1  0.1040E-01  2
  GREY IRON FOUNDRIES (ELECTRIC ARC)
 50 C02       0.05    0.05    0.0       2.0925         0.14    0.34    0.10      240.  0.4090E 00  2  0.6550E 00  1
  MUNICIPAL INCINERATION < 50T/D
 10 B03       0.40    0.40    0.0       0.7000         0.84    1.23    0.51      710.  0.3510E-01  2  0.5610E-01  2
  GLASS MANUFACTURING INDUSTRY  (LEAD GLASS)
 40 D19       6.00    6.00    0.06     13.7700         1.75    2.37    1.19     1200.  0.9040E-01  2  0.9040E-03  3
  INDUSTRIAL INCINERATION (INDUSTRIAL-COMMERCIAL)
 11 B04       0.40    0.40    0.04      1.2920         3.84   10.90    3.20     7700.  0.3870E 01  1  0.3870E 00  2
POLLUTANT IS ACID MIST
 CODE         EU      ES      EN          SIZE         TA      TS      TN      TS-TN   X/AV S      X  X/AV N      X
  EXPLOSIVE IND (LOW EXPLOSIVES)
 20 C18       0.30    0.30    0.01      1.2923         0.10    0.25    0.06      190.  0.1100E 00  2  0.2220E-02  3
  MIXED FUEL BOILERS  (COAL & REFUSE)
 10 A06       0.22    0.22    0.01      6.6000         0.41    0.60    0.27      330.  0.1510E 00  2  0.6880E-02  3
  EXPLOSIVE IND (HIGH EXPLOSIVES)
 20 C17      80.00   20.00    1.60   1219.7671        23.90   58.70   16.79    41900.  0.2620E 02  1  0.2100E 01  1

POLLUTANT IS HS
 CODE         EU      ES      EN          SIZE         TA      TS      TN      TS-TN   X/AV S      X  X/AV N      X
  VISCOSE RAYON
 20 B06      10.90   10.90    1.60    265.9595         2.14    2.14    1.32      820.  0.6590E 00  1  0.9670E-01  2
  CARBON BLACK  (FURNACE PROCESS)
 20 C03      60.00   60.00    0.06   1549.7986        58.06   74.32   31.97    42300.  0.4200E 00  2  0.4200E-03  3
POLLUTANT IS F
 CODE         EU      ES      EN          SIZE         TA      TS      TN      TS-TN   X/AV S      X  X/AV N      X
  FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)
 40 D06       2.00    2.00    2.00     34.4400         0.39    0.74    0.74        0.  0.1750E 02  1  0.1750E 02  1
  FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)
 40 D14       0.07    0.07    0.0       1.2197         0.04    0.09    0.03       60.  0.6190E 00  1  0.1770E-01  2
  PHOSPHORIC ACID PLANTS  (WET PROCESS)
 20 A07       1.00    0.03    0.0      71.3610         0.20    0.65    0.19      460.  0.7100E 00  1  0.1050E 00  2
  ANIMAL FEED DEFLUORINATION
 30 D10     219.00   59.40    0.44   4927.4961         5.35    5.35    3.22     2100.  0.5820E 03  1  0.4290E 01  1


  CERAMIC CLAY MFG
 40 D10       1.00    1.00    0.30      1.4400         5.36    7.61    4.80     2800.  0.1190E 01  1  0.3570E 00  2
  INDUSTRIAL BOILERS  (10-250X10E6 BTU/HR)
 10 A03       0.0     0.0     0.0       0.8571        15.17   17.43   11.29     6100.  0.2620E-01  2  0.4100E-02  1
  HYDROFLUORIC ACID PLANTS
 20 A08      50.00   50.00    0.20    543.8992        14.72   24.59    8.16    16400.  0.1240E 02  1  0.4960E-01  2
```

Table B-3. Minor Source Category Growth

EXPLANATION OF DATA DISPLAY: THE NUMBER OF NEW AND REPLACEMENT HYPOTHETICAL SOURCES OF AVERAGE SIZE IS INDICATED FOR EACH SOURCE CATEGORY FOR EACH 6 MONTH PERIOD BEGINNING IN 1980, THROUGH 1995 IN THE FIRST 4 ROWS OF DATA. THE CUMULATIVE NUMBER OF SOURCES IS INDICATED IN THE FOLLOWING 4 ROWS OF DATA. NOTE IN SOME CASES, AS A RESULT OF THE GROWTH FORMULA USED A "FRACTIONAL" SOURCE GROWTH RESULTS IN A 6 MONTH PERIOD AND IS ONLY DISPLAYED AS INTEGER GROWTH IN THE CUMULATIVE GROWTH SECTION.

```
      1C A01  FOSSIL FUEL BOILERS  (<0.3X10E6 BTU/HR)
{1980}--> 206299.<-6mo.->207244.    207244.    208208.    208208.    209191.    209191.    210193.    210193.    211216.
          211216.      212259.      212259.    213323.    213323.    214409.    214409.    215516.    215516.    216645.
{1990}--> 216645.      217797.      217797.    216972.    218972.    220170.    220170.    221392.    221392.    222639.
          222639.
      CUMULATIVE
{1980}--> 206299.<-6mo.->413543.    620787.    828995.   1037203.   1246393.   1455583.   1665776.   1875969.   2087185.
         2298401.     2510660.     2722919.   2936242.   3149565.   3363973.   3578381.   3793896.   4009411.   4226056.
{1990}-->4442701.     4660497.     4878293.   5097264.   5316235.   5536404.   5756573.   5977965.   6199357.   6421995.
         6644633.
      1C A02  COMMERCIAL BOILERS  (0.3-10X10E6 BTU/HR)
            7582.        7777.        7777.      7980.      7980.      8192.      8192.      8413.      8413.      8644.
            8644.        8885.        8885.      9136.      9136.      9396.      9398.      9671.      9671.      9955.
            9955.       10252.       10252.     10562.     10562.     10885.     10885.     11222.     11222.     11574.
           11574.
      CUMULATIVE
            7582.       15359.       23135.     31116.     39096.     47288.     55480.     63894.     72307.     80951.
           89595.       98480.      107365.    116500.    125636.    135034.    144431.    154102.    163772.    173728.
          183683.      193935.      204188.    214750.    225312.    236197.    247082.    258305.    269527.    281101.
          292674.
      1C B01  WASTE OIL BOILERS
               8.           8.           6.         8.         8.         9.         9.         9.         9.         9.
               9.           9.           9.         9.         9.         9.         9.        10.        10.        10.
              10.          10.          10.        10.        10.        10.        10.        11.        11.        11.
              11.
      CUMULATIVE
               6.          16.          24.        33.        41.        50.        58.        67.        75.        84.
              93.         102.         111.       120.       130.       139.       148.       158.       168.       177.
             187.         197.         207.       217.       227.       238.       248.       259.       269.       280.
             291.
      2C A16  LITHIUM COMPOUNDS

                                             FRACTIONAL GROWTH SOURCE CATEGORY

      CUMULATI
               0.           1.           1.         1.         1.         2.         2.         2.         2.         3.
               3.           3.           4.         4.         4.         5.         5.         5.         6.         6.
               6.           7.           7.         7.         8.         8.         9.         9.         9.        10.
              10.
      2C A19  SODIUM CHLORIDE
               7.           7.           7.         7.         7.         7.         7.         7.         7.         8.
               8.           8.           8.         8.         8.         8.         8.         8.         8.         9.
               9.           9.           9.         9.         9.        10.        10.        10.        10.        10.
              10.
      CUMULATIVE
               7.          13.          20.        27.        34.        41.        48.        56.        63.        71.
              78.          86.          94.       102.       110.       118.       126.       135.       143.       152.
             160.         169.         178.       188.       197.       206.       216.       226.       235.       246.
             256.
```

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Table B-3. (Cont'd)

```
20 A20  LEAD OXIDES
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        2.        2.        2.
         2.
CUMULATIVE
         1.        2.        3.        4.        5.        6.        7.        8.       10.       11.
        12.       13.       14.       15.       17.       18.       19.       20.       22.       23.
        24.       26.       27.       29.       30.       32.       33.       35.       36.       38.
        39.
20 B14  POLYVINYL ALCOHOL PLANTS
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        1.        1.        1.        1.        1.        1.        1.
         1.
CUMULATIVE
         0.        0.        1.        1.        1.        1.        1.        2.        2.        2.
         3.        3.        3.        4.        4.        4.        5.        5.        5.        6.
         6.        7.        7.        8.        8.        9.        9.       10.       11.       11.
        12.
20 B15  POLYCARBONATES PLANTS
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        1.        1.        1.
         1.
CUMULATIVE
         0.        0.        0.        1.        1.        1.        1.        1.        2.        2.
         2.        2.        3.        3.        3.        3.        4.        4.        4.        5.
         5.        6.        6.        6.        7.        7.        8.        8.        9.        9.
        10.
20 B16  EPOXY RESIN PLANT (UNMODIFIED)
         0.        0.        0.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        2.        2.        2.
         2.
CUMULATIVE
         0.        1.        1.        2.        2.        3.        4.        4.        5.        6.
         6.        7.        8.        9.       10.       10.       11.       12.       13.       14.
        16.       17.       18.       19.       21.       22.       24.       25.       27.       29.
        30.
20 B18  ALKYD
         4.        4.        4.        4.        4.        4.        4.        4.        4.        4.
         4.        4.        4.        4.        4.        4.        4.        4.        4.        4.
         4.        4.        4.        4.        4.        4.        4.        4.        4.        4.
         4.
CUMULATIVE
         4.        8.       11.       15.       19.       23.       26.       30.       34.       38.
        42.       45.       49.       53.       57.       61.       65.       69.       73.       76.
        80.       84.       88.       92.       96.      100.      104.      108.      112.      116.
       120.
20 B20  PLASTICS AND RESINS (POLYAMIDES)
         3.        3.        3.        3.        3.        4.        4.        4.        4.        5.
         5.        5.        5.        6.        6.        7.        7.        8.        8.        9.
         9.       10.       10.       12.       12.       14.       14.       15.       15.       18.
        18.
CUMULATIVE
         3.        6.        9.       12.       16.       20.       23.       28.       32.       37.
        42.       47.       53.       59.       65.       72.       79.       87.       95.      104.
       113.      124.      134.      146.      158.      171.      185.      200.      216.      234.
       251.
```

Table B-3. (Cont'd)

```
20 C09  PAINT MFG.
         63.         64.         64.         64.         64.         65.         65.         65.         65.         65.
         65.         66.         66.         67.         67.         67.         67.         68.         68.         68.
         68.         69.         69.         69.         69.         70.         70.         71.         71.         71.
         71.
CUMULATIVE
         63.        127.        190.        254.        318.        383.        447.        512.        577.        643.
        708.        774.        840.        907.        973.       1040.       1108.       1175.       1243.       1311.
       1379.       1448.       1517.       1586.       1656.       1726.       1796.       1867.       1937.       2009.
       2080.
20 D05  POLY-ISOPRENE(IR)

                                              FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
          0.          0.          0.          0.          0.          0.          1.          1.          1.          1.
          1.          1.          1.          1.          1.          1.          1.          2.          2.          2.
          2.          2.          2.          2.          2.          2.          2.          2.          3.          3.
          3.
21 A01  HYDROCHLORIC ACID INDUSTRY
          8.          9.          9.          9.          9.          9.          9.         10.         10.         10.
         10.         11.         11.         11.         11.         12.         12.         12.         12.         13.
         13.         14.         14.         15.         15.         15.         15.         16.         16.         17.
         17.
CUMULATIVE
          8.         17.         26.         35.         43.         53.         62.         72.         82.         92.
        102.        113.        124.        135.        147.        158.        170.        183.        195.        208.
        221.        235.        249.        264.        278.        293.        309.        325.        341.        358.
        375.
21 A21  LEAD PIGMENTS MFGR. (RED LEAD)

                                              FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
          0.          1.          1.          1.          1.          2.          2.          2.          2.          3.
          3.          3.          3.          4.          4.          4.          5.          5.          5.          5.
          6.          6.          6.          7.          7.          7.          8.          8.          8.          8.
          9.
22 A21  LEAD PIGMENTS MFGR  (WHITE LEAD)

                                              FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
          0.          1.          1.          1.          2.          2.          2.          3.          3.          4.
          4.          4.          5.          5.          5.          6.          6.          6.          7.          7.
          8.          8.          8.          9.          9.         10.         10.         10.         11.         11.
         11.
2[illegible] [illegible]1  LEAD PIGMENTS MFGR  (LEAD CHROMATE)

                                              FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
          0.          1.          1.          1.          1.          2.          2.          2.          3.          3.

          3.          4.          4.          4.          4.          5.          5.          5.          6.          6.
          6.          7.          7.          7.          8.          8.          8.          9.          9.          9.
         10.
```

Table B-3. (Cont'd)

```
30 D03  MEAT SMOKEHOUSES
     35.       35.       35.       35.       35.       35.       35.       35.       35.       35.
     35.       35.       35.       35.       35.       35.       35.       35.       35.       35.
     35.       35.       35.       35.       35.       35.       35.       35.       35.       35.
     35.
CUMULATIVE
     35.       69.      104.      139.      173.      208.      243.      278.      312.      347.
    382.      416.      451.      486.      520.      555.      590.      624.      659.      694.
    729.      763.      798.      833.      867.      902.      937.      971.     1006.     1041.
   1075.
 30 D05  FISH PROCESSING
                              FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
[illegible]     1.        1.        2.        2.        2.        3.        3.        4.        4.
      4.        5.        5.        6.        6.        6.        7.        7.        8.        8.
      8.        9.        9.       10.       10.       10.       11.       11.       12.       12.
     12.
 30 D12  DIRECT FIRING OF MEATS
    950.      985.      985.     1022.     1022.     1061.     1061.     1103.     1103.     1149.
   1149.     1197.     1197.     1249.     1249.     1305.     1305.     1364.     1364.     1428.
   1426.     1497.     1497.     1570.     1570.     1648.     1648.     1732.     1732.     1822.
   1822.
CUMULATIVE
    950.     1935.     2920.     3942.     4963.     6024.     7085.     8189.     9292.    10441.
  11590.    12787.    13984.    15233.    16482.    17787.    19092.    20456.    21821.    23249.
  24677.    26174.    27670.    29240.    30810.    32458.    34106.    35838.    37570.    39392.
  41214.
 30 D17  DEEP FAT FRYING
     28.       29.       29.       29.       29.       30.       30.       31.       31.       32.
     32.       33.       33.       34.       34.       35.       35.       36.       36.       37.
     37.       38.       38.       39.       39.       40.       40.       41.       41.       43.
     43.
CUMULATIVE
     28.       56.       85.      114.      143.      173.      203.      234.      265.      297.
    329.      361.      394.      428.      461.      496.      530.      566.      602.      638.
    675.      713.      750.      789.      828.      868.      909.      950.      991.     1034.
   1077.
 30 D19  PHARMACEUTICAL
     42.       44.       44.       47.       47.       50.       50.       53.       53.       57.
     57.       60.       60.       65.       65.       69.       69.       74.       74.       79.
     79.       85.       85.       92.       92.       99.       99.      106.      106.      115.
    115.
CUMULATIVE
     42.       86.      130.      177.      224.      274.      324.      377.      430.      486.
    543.      603.      663.      728.      793.      862.      931.     1005.     1079.     1158.
   1238.     1323.     1408.     1500.     1592.     1690.     1789.     1895.     2002.     2116.
   2231.
 35 D04  (AGG) DIRECT COFFEE ROASTING PLANTS
      2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
      2.        2.        2.        2.        2.        2.        2.        3.        3.        3.
      3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
      3.
CUMULATIVE
      2.        4.        6.        8.        9.       11.       14.       16.       18.       20.
     22.       24.       27.       29.       31.       34.       36.       39.       42.       44.
     47.       50.       52.       55.       58.       61.       64.       67.       70.       74.
     77.
```

Table B-3. (Cont'd)

```
36 D04  (AGG) INDIRECT COFFEE ROASTING PLANTS
         2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
         2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
         2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
         2.
CUMULATIVE
         2.        4.        5.        7.        9.       11.       13.       15.       16.       18.
        20.       22.       24.       25.       27.       29.       31.       33.       35.       36.
        38.       40.       42.       44.       46.       47.       49.       51.       53.       55.
        56.
40 C03  CONCRETE BATCH PLANT
        57.       58.       58.       59.       59.       60.       60.       61.       61.       62.
        62.       63.       63.       64.       64.       65.       65.       66.       66.       68.
        68.       69.       69.       70.       70.       72.       72.       73.       73.       75.
        75.
CUMULATIVE
        57.      115.      172.      231.      290.      349.      409.      470.      530.      592.
       654.      717.      780.      844.      908.      973.     1038.     1104.     1171.     1239.
      1306.     1375.     1444.     1514.     1585.     1656.     1728.     1801.     1874.     1949.
      2023.
40 D15  FRIT MFG  (ROTARY FURNACE)
         7.        7.        7.        7.        7.        7.        7.        7.        7.        7.
         7.        7.        7.        7.        7.        7.        7.        7.        7.        7.
         7.        7.        7.        7.        7.        7.        7.        7.        7.        7.
         7.
CUMULATIVE
         7.       15.       22.       30.       37.       45.       52.       60.       67.       75.
        82.       89.       97.      104.      112.      119.      127.      134.      142.      149.
       156.      164.      171.      179.      186.      194.      201.      209.      216.      224.
       231.
40 D18  GLASS MANUFACTURING INDUSTRY  (OPAL GLASS)
         3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
         3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
         3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
         3.
CUMULATIVE
         3.        6.       10.       13.       16.       19.       23.       26.       29.       32.
        36.       39.       42.       45.       49.       52.       55.       58.       62.       65.
        68.       71.       75.       78.       81.       84.       87.       91.       94.       97.
       100.
46 F01  (AGG) NON-METALLIC MINING - MICA
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.
CUMULATIVE
         1.        1.        2.        3.        3.        4.        4.        5.        6.        6.
         7.        8.        8.        9.       10.       10.       11.       12.       12.       13.
        14.       14.       15.       16.       16.       17.       18.       18.       19.       20.
        20.
50 B06  SECONDARY MAGNESIUM SMELTER
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.
CUMULATIVE
         1.        2.        3.        5.        6.        7.        8.        9.       10.       11.
        12.       14.       15.       16.       17.       18.       19.       20.       22.       23.
        24.       25.       26.       27.       28.       30.       31.       32.       33.       34.
        35.
```

Table B-3. (Cont'd)

```
50 C01  GREY IRON FOUNDRIES  (INDUCTION FURNACE)
        5.        5.        5.        5.        5.        5.        5.        5.        5.        5.
        5.        5.        5.        5.        5.        5.        5.        5.        5.        5.
        5.        5.        5.        5.        5.        5.        5.        5.        5.        5.
        5.
CUMULATIVE
        5.       10.       15.       20.       26.       31.       36.       41.       46.       51.
       56.       61.       67.       72.       77.       82.       87.       92.       97.      102.
      108.      113.      118.      123.      128.      133.      138.      143.      149.      154.
      159.
50 D03  STEEL FOUNDRIES  (INDUCTION)
       29.       29.       29.       29.       29.       29.       29.       29.       29.       29.
       29.       29.       29.       29.       29.       29.       29.       29.       29.       29.
       29.       29.       29.       29.       29.       29.       29.       29.       29.       29.
       29.
CUMULATIVE
       29.       57.       86.      114.      143.      172.      200.      229.      257.      286.
      314.      343.      372.      400.      429.      457.      486.      515.      543.      572.
      600.      629.      658.      686.      715.      743.      772.      800.      829.      858.
      886.
60 E06  GRAPHIC ARTS INDUSTRY  (LITHOGRAPHY)
       22.       23.       23.       24.       24.       24.       24.       25.       25.       26.
       26.       26.       26.       27.       27.       28.       28.       29.       29.       30.
       30.       31.       31.       32.       32.       33.       33.       34.       34.       35.
       35.
CUMULATIVE
       22.       45.       68.       92.      116.      140.      164.      189.      214.      240.
      266.      292.      318.      346.      373.      401.      429.      458.      487.      516.
      546.      577.      608.      640.      671.      704.      737.      771.      805.      840.
      875.
60 D01  SOLVENT METAL CLEANING  (COLD CLEANERS)
    45655.    46311.    46311.    46989.    46989.    47689.    47689.    48412.    48412.    49159.
    49159.    49930.    49930.    50726.    50726.    51549.    51549.    52399.    52399.    53276.
    53276.    54183.    54183.    55119.    55119.    56085.    56085.    57084.    57084.    58115.
    58115.
CUMULATIVE
    45655.    91966.   138277.   185266.   232255.   279944.   327633.   376045.   424457.   473616.
   522774.   572704.   622634.   673361.   724087.   775636.   827185.   879584.   931983.   985259.
  1038535.  1092717.  1146899.  1202017.  1257135.  1313220.  1369305.  1426388.  1483471.  1541585.
  1595699.
60 D02  SOLVENT METAL CLEANING  (OPEN TOP VAPOR DEGREASERS)
      649.      655.      655.      661.      661.      667.      667.      673.      673.      679.
      679.      685.      685.      692.      692.      698.      698.      705.      705.      712.
      712.      719.      719.      727.      727.      734.      734.      742.      742.      749.
      749.
CUMULATIVE
      649.     1304.     1959.     2620.     3281.     3947.     4614.     5286.     5959.     6638.
     7317.     8002.     8687.     9379.    10070.    10769.    11467.    12172.    12877.    13589.
    14301.    15021.    15740.    16466.    17193.    17927.    18661.    19402.    20144.    20894.
    21643.
60 D03  SOLVENT METAL CLEANING  (CONVEYORIZED DEGREASING)
      157.      160.      160.      163.      163.      167.      167.      170.      170.      174.
      174.      178.      178.      182.      182.      186.      186.      190.      190.      195.
      195.      199.      199.      204.      204.      209.      209.      214.      214.      220.
      220.
CUMULATIVE
      157.      317.      477.      641.      804.      971.     1138.     1308.     1478.     1652.
     1826.     2004.     2181.     2363.     2545.     2730.     2916.     3106.     3296.     3491.
     3685.     3885.     4084.     4288.     4492.     4701.     4910.     5124.     5338.     5558.
     5778.
```

Table B-3. (Cont'd)

```
60 F05  P.T.M. ID.  (GAS. BULK PLANTS)(STORAGE & TRANSFER)
         51.        51.        51.        51.        51.        51.        51.        51.        51.        51.
         51.        51.        51.        51.        51.        51.        51.        51.        51.        51.

         51.        51.        51.        51.        51.        51.        51.        51.        51.        51.
         51.
CUMULATIVE
         51.       101.       152.       202.       253.       303.       354.       404.       455.       505.
        556.       606.       657.       707.       758.       808.       859.       909.       960.      1010.
       1061.      1111.      1162.      1212.      1263.      1313.      1364.      1414.      1465.      1515.
       1566.
61 F06  (AGG) PETROLEUM,TRANSP AND MARKETING - SERVICE STATIONS
      11918.     12138.     12138.     12365.     12365.     12601.     12601.     12844.     12844.     13096.
      13096.     13357.     13357.     13627.     13627.     13906.     13906.     14195.     14195.     14494.
      14494.     14803.     14803.     15122.     15122.     15453.     15453.     15796.     15796.     16150.
      16150.
CUMULATIVE
      11918.     24055.     36193.     48558.     60924.     73524.     86125.     98969.    111814.    124910.
     138006.    151364.    164721.    178348.    191974.    205880.    219786.    233981.    248176.    262669.
     277163.    291966.    306768.    321891.    337013.    352466.    367920.    383715.    399511.    415660.
     431810.
64 B03  INDUSTRIAL SURFACE COATING  (METAL FURNITURE COATING)
         29.        31.        31.        32.        32.        34.        34.        36.        36.        38.
         38.        40.        40.        43.        43.        45.        45.        48.        48.        51.
         51.        54.        54.        57.        57.        61.        61.        65.        65.        69.
         69.
CUMULATIVE
         29.        60.        91.       124.       156.       190.       225.       261.       297.       335.
        373.       413.       453.       496.       538.       583.       628.       676.       724.       774.
        825.       879.       933.       990.      1047.      1108.      1169.      1233.      1298.      1367.
       1436.
65 B02  INDUSTRIAL SURFACE COATING  (WOOD FURNITURE COATING)
         27.        28.        28.        30.        30.        31.        31.        33.        33.        35.
         35.        37.        37.        39.        39.        41.        41.        43.        43.        46.
         46.        49.        49.        52.        52.        55.        55.        59.        59.        63.
         63.
CUMULATIVE
         27.        55.        83.       112.       142.       173.       204.       237.       270.       304.
        339.       376.       412.       451.       489.       530.       571.       615.       658.       704.
        750.       799.       848.       900.       952.      1008.      1063.      1122.      1181.      1243.
       1306.
65 B03  INDUSTRIAL SURFACE COATING  (FLATWOOD PRODUCTS)
         74.        77.        77.        81.        81.        86.        86.        90.        90.        95.
         95.       101.       101.       107.       107.       113.       113.       120.       120.       127.
        127.       135.       135.       143.       143.       152.       152.       162.       162.       173.
        173.
CUMULATIVE
         74.       151.       228.       310.       391.       477.       563.       653.       743.       839.
        934.      1035.      1136.      1242.      1349.      1462.      1575.      1694.      1814.      1941.
       2066.      2203.      2337.      2481.      2624.      2776.      2929.      3091.      3253.      3426.
       3599.
86 B02  PULPBOARD MFGR.
          8.         8.         8.         9.         9.         9.         9.         9.         9.         9.
          9.         9.         9.         9.         9.         9.         9.         9.         9.         9.
          9.        10.        10.        10.        10.        10.        10.        10.        10.        10.
         10.
CUMULATIVE
          8.        17.        25.        34.        42.        51.        60.        68.        77.        86.
         95.       104.       113.       122.       131.       140.       149.       159.       168.       177.
        187.       196.       206.       216.       225.       235.       245.       255.       265.       275.
        285.
```

Table B-3. (Cont'd)

```
90 B01  LEAD ACID BATTERY
            6.          6.          6.          6.          6.          6.          6.          6.          6.          6.
            6.          7.          7.          7.          7.          7.          7.          7.          7.          7.
            7.          8.          8.          8.          8.          8.          8.          9.          9.          9.
            9.
CUMULATIVE
            6.         11.         17.         23.         29.         35.         41.         48.         54.         60.
           67.         73.         80.         87.         94.        101.        108.        115.        122.        130.
          137.        145.        153.        161.        169.        177.        185.        194.        202.        211.
          220.
90 C01  CABLE COVER PROD. PLANT


                                       DECLINING GROWTH SOURCE CATEGORY


90 D01  TYPE METAL PRODUCTION PLANT


                                       DECLINING GROWTH SOURCE CATEGORY


90 E01  CAN MFG PLANT


                                       DECLINING GROWTH SOURCE CATEGORY


90 F03  TEXTILE MFG (CARPET MFG)
           12.         13.         13.         13.         13.         14.         14.         15.         15.         15.
           15.         16.         16.         17.         17.         18.         18.         19.         19.         20.
           20.         21.         21.         22.         22.         23.         23.         25.         25.         26.
           26.
CUMULATIVE
           12.         25.         38.         51.         65.         79.         93.        108.        122.        138.
          153.        170.        186.        203.        220.        238.        256.        275.        293.        313.
          333.        354.        375.        397.        419.        443.        466.        491.        516.        542.
          568.
90 F04  TEXTILE MFG (TEXTURING)
            6.          7.          7.          7.          7.          8.          8.          8.          8.          9.
            9.          9.          9.         10.         10.         11.         11.         12.         12.         13.
           13.         14.         14.         15.         15.         16.         16.         17.         17.         18.
           18.
CUMULATIVE
            6.         13.         20.         27.         35.         42.         50.         58.         67.         75.
           84.         94.        103.        113.        124.        134.        145.        157.        169.        181.
          194.        208.        221.        236.        250.        266.        282.        299.        316.        335.
          353.
```

Table B-4. Major Source Category Growth

EXPLANATION OF DATA DISPLAY: THE NUMBER OF NEW AND REPLACEMENT HYPOTHETICAL SOURCES OF AVERAGE SIZE IS INDICATED FOR EACH SOURCE CATEGORY FOR EACH 6 MONTH PERIOD BEGINNING IN 1980, THROUGH 1995 IN THE FIRST 4 ROWS OF DATA. THE CUMULATIVE NUMBER OF SOURCES IS INDICATED IN THE FOLLOWING 4 ROWS OF DATA. NOTE IN SOME CASES, AS A RESULT OF THE GROWTH FORMULA USED A "FRACTIONAL" SOURCE GROWTH RESULTS IN A 6 MONTH PERIOD AND IS ONLY DISPLAYED AS INTEGER GROWTH IN THE CUMULATIVE GROWTH SECTION.

```
  10 A03  INDUSTRIAL BOILERS  (10-250X1026 BTU/HR)
{1980}—→ 187.←6mo.→188.      188.      189.      189.      189.      189.      190.      190.      191.
          191.      192.      192.      193.      193.      194.      194.      194.      194.      195.
{1990} —→ 195.      196.      196.      197.      197.      198.      198.      199.      199.      200.
          200.
  CUMULATIVE
{1980}—→ 187.←6mo.→375.      563.      751.      940.     1129.     1318.     1508.     1699.     1890.
         2081.     2272.     2464.     2657.     2850.     3043.     3237.     3431.     3625.     3821.
{1990}—→ 4016.     4212.     4408.     4605.     4802.     5000.     5198.     5397.     5596.     5796.
         5996.
  10 A06  MIXED FUEL BOILERS  (COAL & REFUSE)
            1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
            1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
            1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
            1.
  CUMULATIVE
            1.        3.        4.        5.        7.        8.        9.       11.       12.       14.
           15.       16.       18.       19.       20.       22.       23.       24.       26.       27.
           28.       30.       31.       33.       34.       35.       37.       38.       39.       41.
           42.
  10 A07  MIXED FUEL BOILERS  (OIL & REFUSE)
            1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
            1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
            1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
            1.
  CUMULATIVE
            1.        3.        4.        5.        7.        8.        9.       11.       12.       13.
           15.       16.       17.       19.       20.       21.       23.       24.       25.       27.
           28.       29.       31.       32.       33.       35.       36.       37.       39.       40.
           41.
  10 B03  MUNICIPAL INCINERATION < 50T/D
           29.       29.       29.       29.       29.       29.       29.       29.       29.       29.
           29.       29.       29.       29.       29.       29.       29.       29.       29.       29.
           29.       29.       29.       29.       29.       29.       29.       29.       29.       29.
           29.
  CUMULATIVE
           29.       57.       86.      114.      143.      171.      200.      228.      257.      286.
          314.      343.      371.      400.      428.      457.      486.      514.      543.      571.
          600.      628.      657.      685.      714.      743.      771.      800.      828.      857.
          885.
  10 C01  STATIONARY INTERNAL COMBUSTION ENGINES (SPARK IGNITION)
           55.       55.       55.       55.       55.       55.       55.       55.       55.       55.
           55.       55.       55.       55.       55.       55.       55.       55.       55.       55.
```

Table B-4. (Cont'd)

```
           55.         55.         55.         55.         55.         55.         55.         55.         55.         55.
           55.
CUMULATIVE
           55.        110.        165.        220.        276.        331.        386.        441.        496.        551.
          606.        661.        716.        771.        827.        882.        937.        992.       1047.       1102.
         1157.       1212.       1267.       1322.       1378.       1433.       1488.       1543.       1598.       1653.
         1708.
10 C02  STATIONARY INTERNAL COMBUSTION ENGINES(DIESEL & DUAL FUEL)
          156.        156.        156.        156.        156.        156.        156.        156.        156.        156.
          156.        156.        156.        156.        156.        156.        156.        156.        156.        156.
          156.        156.        156.        156.        156.        156.        156.        156.        156.        156.
          156.
CUMULATIVE
          156.        313.        469.        626.        782.        939.       1095.       1252.       1408.       1565.
         1721.       1878.       2034.       2191.       2347.       2504.       2660.       2817.       2973.       3130.
         3286.       3443.       3599.       3756.       3912.       4069.       4225.       4382.       4538.       4695.
         4851.
11 E04  INDUSTRIAL INCINERATION  (INDUSTRIAL-COMMERCIAL)
            1.          1.          1.          2.          2.          2.          2.          2.          2.          2.
            2.          2.          2.          2.          2.          3.          3.          3.          3.          3.
            3.          4.          4.          4.          4.          4.          4.          5.          5.          5.
            5.
CUMULATIVE
            1.          3.          4.          6.          8.          9.         11.         13.         15.         17.
           19.         21.         24.         26.         28.         31.         34.         37.         40.         43.
           46.         50.         53.         57.         61.         65.         70.         74.         79.         84.
           90.
11 C01  STATIONERY PIPELINE COMPRESSOR ENGINES
           58.         58.         58.         58.         58.         58.         58.         58.         58.         58.
           58.         58.         58.         58.         58.         58.         58.         58.         58.         58.
           58.         58.         58.         58.         58.         58.         58.         58.         58.         58.
           58.
CUMULATIVE
           58.        116.        174.        232.        290.        348.        406.        465.        523.        581.
          635.        697.        755.        813.        871.        929.        987.       1045.       1103.       1161.
         1219.       1277.       1336.       1394.       1452.       1510.       1568.       1626.       1684.       1742.
         1800.
12 E04  INDUSTRIAL INCINERATION  (IND ORGANIC LIQUID WASTE INC)
           11.         11.         11.         11.         11.         11.         11.         11.         11.         11.
           11.         11.         11.         11.         11.         11.         11.         11.         11.         11.
           11.         11.         11.         11.         11.         11.         11.         11.         11.         11.
           11.
CUMULATIVE
           11.         21.         32.         42.         53.         63.         74.         84.         95.        105.
          116.        126.        137.        147.        158.        168.        179.        189.        200.        210.
          221.        231.        242.        252.        263.        273.        284.        294.        305.        315.
          326.
20 A04  ADIPIC ACID PLANTS

                                                  FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
            0.          0.          1.          1.          1.          1.          1.          2.          2.          2.
            2.          3.          3.          3.          3.          4.          4.          4.          4.          5.
            5.          5.          6.          6.          6.          6.          7.          7.          7.          8.
            8.
20 A07  PHOSPHORIC ACID PLANTS  (WET PROCESS)
            6.          6.          6.          7.          7.          7.          7.          8.          8.          9.
            9.         10.         10.         11.         11.         12.         12.         13.         13.         15.
           15.         16.         16.         18.         18.         20.         20.         22.         22.         25.
           25.
```

Table B-4. (Cont'd)

```
CUMULATIVE
           6.         12.         18.         25.         31.         39.         46.         54.         62.         71.
          80.         89.         99.        110.        121.        133.        145.        158.        171.        185.
         200.        216.        232.        250.        268.        288.        308.        331.        353.        378.
         403.
20 A08  HYDROFLUORIC ACID PLANTS
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.
CUMULATIVE
           1.          3.          4.          6.          7.          9.         10.         12.         13.         15.
          16.         18.         19.         21.         22.         24.         25.         27.         28.         30.
          31.         33.         34.         36.         37.         39.         40.         42.         43.         45.
          46.
20 A10  PHOSPHORIC  ACID PLANTS  (THERMAL PROCESS)
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.
CUMULATIVE
           1.          2.          3.          4.          5.          6.          7.          8.          9.         10.
          11.         12.         13.         14.         15.         16.         17.         19.         20.         21.
          22.         23.         24.         25.         26.         27.         28.         29.         30.         31.
          32.
20 A11  ACETIC ACID  (ACETALDEHYDE)
           0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
           0.          0.          0.          0.          0.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.
CUMULATIVE
           0.          1.          1.          1.          2.          2.          2.          3.          3.          4.
           4.          5.          5.          5.          6.          6.          7.          7.          8.          9.
           9.         10.         10.         11.         12.         12.         13.         14.         15.         15.
          16.
20 A12  ACETIC ACID  (METHANOL)

                                        FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
           0.          0.          0.          1.          1.          1.          1.          1.          1.          2.
           2.          2.          2.          3.          3.          3.          3.          4.          4.          4.
           5.          5.          5.          6.          6.          6.          7.          7.          8.          8.
           9.
20 A13  ACETIC ACID  (BUTANE)


                                        DECLINING GROWTH SOURCE CATEGORY



20 A14  CYCLOHEXANE
           0.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.
CUMULATIVE
           0.          1.          2.          2.          3.          3.          4.          4.          5.          6.
```

Table B-4. (Cont'd)

```
           6.         7.         7.         8.         9.        10.        10.        11.        12.        13.
          14.        14.        15.        16.        17.        18.        19.        20.        21.        22.
          23.
20 A15  BORAX BORIC ACID

                                        FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
           0.         0.         0.         0.         0.         0.         0.         0.         0.         1.
           1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
           1.         1.         1.         1.         1.         1.         2.         2.         2.         2.
           2.
20 A17  HYDROGEN FLUORIDE

                                        FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
           0.         1.         1.         1.         2.         2.         2.         2.         3.         3.
           3.         4.         4.         4.         5.         5.         5.         6.         6.         7.
           7.         7.         8.         8.         8.         9.         9.        10.        10.        10.
          11.
20 A18  POTASH

                                        FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
           0.         0.         1.         1.         1.         1.         2.         2.         2.         2.
           3.         3.         3.         3.         4.         4.         4.         4.         5.         5.
           5.         5.         6.         6.         6.         6.         7.         7.         7.         8.
           8.
20 B03  POLYETHYLENE (HIGH DENSITY)
           2.         2.         2.         2.         2.         2.         2.         2.         2.         3.
           3.         3.         3.         3.         3.         4.         4.         4.         4.         5.
           5.         5.         5.         6.         6.         7.         7.         8.         8.         9.
           9.
CUMULATIVE
           2.         3.         5.         7.         9.        11.        14.        16.        18.        21.
          24.        27.        30.        34.        37.        41.        45.        49.        54.        59.
          63.        69.        74.        80.        87.        93.       100.       108.       115.       124.
         133.
20 B04  POLYETHYLENE (LOW DENSITY)
           1.         1.         1.         1.         1.         1.         1.         2.         2.         2.
           2.         2.         2.         2.         2.         2.         2.         2.         2.         3.
           3.         3.         3.         3.         3.         3.         3.         3.         3.         4.
           4.
CUMULATIVE
           1.         2.         4.         5.         7.         8.         9.        11.        13.        14.
          16.        18.        20.        22.        24.        26.        28.        31.        33.        35.
          38.        41.        43.        46.        49.        52.        56.        59.        62.        66.
          70.
20 B05  POLYSTYRENE
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.         2.         2.         3.         3.         3.         3.         3.         3.         3.
           3.         3.         3.         3.         3.         3.         3.         4.         4.         4.
           4.
CUMULATIVE
           2.         4.         6.         8.        10.        12.        14.        17.        19.        21.
          24.        26.        29.        31.        34.        37.        39.        42.        45.        48.
          51.        54.        57.        61.        64.        67.        71.        74.        78.        82.
```

Table B-4. (Cont'd)

```
         86.
20 B06  SYNTHETIC FIBERS INDUSTRY (VISCOSE RAYON)
                                         FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
         0.      0.      0.      1.      1.      1.      1.      1.      1.      1.
         2.      2.      2.      2.      2.      2.      2.      3.      3.      3.
         3.      3.      3.      3.      4.      4.      4.      4.      4.      4.
         4.
20 B07  POLYPROPLYENE
         1.      1.      1.      2.      2.      2.      2.      2.      2.      2.
         2.      2.      2.      3.      3.      3.      3.      3.      3.      4.
         4.      4.      4.      5.      5.      5.      5.      6.      6.      7.
         7.
CUMULATIVE
         1.      3.      4.      6.      7.      9.     11.     13.     15.     17.
        19.     22.     24.     27.     30.     33.     36.     39.     43.     47.
        51.     55.     59.     64.     69.     74.     80.     86.     92.     99.
       106.
20 B08  SYNTHETIC FIBERS INDUSTRY (DACRON POLYESTER)
         3.      4.      4.      4.      4.      4.      4.      4.      4.      5.
         5.      5.      5.      5.      5.      6.      6.      6.      6.      7.
         7.      8.      8.      8.      8.      9.      9.     10.     10.     11.
        11.
CUMULATIVE
         3.      7.     10.     14.     18.     22.     26.     31.     35.     40.
        44.     49.     55.     60.     66.     71.     77.     84.     90.     97.
       104.    112.    119.    127.    136.    145.    153.    163.    173.    183.
       194.
20 B09  SYNTHETIC FIBER INDUSTRY  (NYLON)
         2.      3.      3.      3.      3.      3.      3.      3.      3.      3.
         3.      4.      4.      4.      4.      4.      4.      4.      4.      5.
         5.      5.      5.      5.      5.      6.      6.      6.      6.      7.
         7.
CUMULATIVE
         2.      5.      8.     10.     13.     16.     19.     22.     25.     28.
        32.     35.     39.     42.     46.     50.     54.     58.     63.     67.
        72.     77.     82.     87.     92.     98.    104.    110.    116.    122.
       129.
2C B10  PHENOLIC RESINS
                                         FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
         0.      0.      0.      0.      0.      1.      1.      1.      1.      1.
         1.      1.      1.      1.      2.      2.      2.      2.      2.      2.
         2.      2.      3.      3.      3.      3.      3.      3.      3.      4.
         4.
20 B11  UREA-MELAMINE
                                         FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
         0.      0.      0.      0.      0.      1.      1.      1.      1.      1.
         1.      1.      1.      1.      2.      2.      2.      2.      2.      2.
         2.      2.      3.      3.      3.      3.      3.      3.      3.      4.
         4.
20 B12  ABS-SAN RESIN PLANT
```

Table B-4. (Cont'd)

```
        1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
        1.        1.        1.        1.        1.        1.        1.        1.        1.        2.
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
        2.
CUMULATIVE
        1.        1.        2.        3.        3.        4.        5.        6.        6.        7.
        8.        9.       10.       11.       13.       14.       15.       16.       18.       19.
       21.       22.       24.       26.       28.       30.       32.       34.       36.       39.
       41.
20 B13  ACETATE RAYON

                              FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
        0.        1.        1.        1.        1.        2.        2.        2.        2.        3.
        3.        3.        4.        4.        4.        4.        5.        5.        5.        5.
        6.        6.        6.        6.        7.        7.        7.        8.        8.        8.
        8.
20 B17  PLASTICS AND RESINS  (ACRYLIC)
       13.       14.       14.       15.       15.       16.       16.       18.       18.       19.
       19.       21.       21.       23.       23.       25.       25.       27.       27.       30.
       30.       32.       32.       36.       36.       39.       39.       43.       43.       47.
       47.
CUMULATIVE
       13.       27.       41.       56.       71.       87.      103.      121.      139.      158.
      177.      198.      219.      241.      264.      289.      314.      341.      368.      397.
      427.      460.      492.      528.      563.      603.      642.      685.      728.      775.
      823.
20 B19  POLYESTER RESIN
        2.        2.        2.        2.        2.        2.        2.        3.        3.        3.
        3.        3.        3.        3.        3.        4.        4.        4.        4.        4.
        4.        5.        5.        5.        5.        5.        5.        6.        6.        6.
        6.
CUMULATIVE
        2.        4.        6.        9.       11.       13.       16.       19.       21.       24.
       27.       30.       33.       36.       40.       43.       47.       51.       55.       59.
       63.       68.       72.       77.       82.       88.       93.       99.      105.      111.
      118.
20 B21  UREA
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
        2.
CUMULATIVE
        2.        3.        5.        7.        9.       10.       12.       14.       16.       18.
       20.       21.       23.       25.       27.       29.       31.       33.       35.       37.
       39.       41.       43.       45.       47.       49.       51.       54.       56.       58.
       60.
20 C03  CARBON BLACK  (FURNACE PROCESS)
        1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
        1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
        1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
        1.
CUMULATIVE
        1.        2.        3.        4.        5.        7.        8.        9.       10.       11.
       12.       13.       14.       16.       17.       18.       19.       20.       21.       22.
       24.       25.       26.       27.       28.       30.       31.       32.       33.       35.
       36.
20 C06  ACRYLONITRILE PLANTS
        1.        1.        1.        1.        1.        1.        1.        2.        2.        2.
        2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
```

Table B-4. (Cont'd)

```
             2.        3.        3.        3.        3.        3.        3.        3.        3.        4.
             4.
CUMULATIVE
             1.        2.        4.        5.        6.        8.        9.       11.       12.       14.
            15.       17.       19.       21.       23.       25.       27.       29.       31.       34.
            36.       39.       41.       44.       47.       50.       53.       56.       60.       63.
            67.
20 C07  ETHYLENE DICHLORIDE PLANTS  (OXYCHLORINATION PROCESS)
             1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
             1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
             1.        1.        1.        1.        1.        2.        2.        2.        2.        2.
             2.
CUMULATIVE
             1.        1.        2.        3.        3.        4.        5.        6.        7.        7.
             8.        9.       10.       11.       12.       13.       14.       15.       17.       18.
            19.       20.       22.       23.       24.       26.       27.       29.       31.       32.
            34.
20 C08  FORMALDEHYDE PLANTS
            11.       11.       11.       12.       12.       13.       13.       14.       14.       15.
            15.       16.       16.       17.       17.       18.       18.       19.       19.       21.
            21.       22.       22.       24.       24.       26.       26.       28.       26.       31.
            31.
CUMULATIVE
            11.       22.       33.       45.       57.       70.       82.       96.      109.      124.
           138.      154.      170.      186.      203.      221.      239.      258.      278.      299.
           319.      342.      364.      389.      413.      439.      465.      494.      522.      553.
           583.
20 C10  DETERGENT MANUFACTURING PLANTS
            12.       12.       12.       13.       13.       13.       13.       14.       14.       14.
            14.       15.       15.       15.       15.       16.       16.       16.       16.       17.
            17.       17.       17.       18.       18.       19.       19.       19.       19.       20.
            20.
CUMULATIVE
            12.       24.       37.       49.       62.       75.       89.      102.      116.      130.
           144.      159.      174.      189.      204.      220.      235.      252.      268.      285.
           301.      319.      336.      354.      372.      391.      410.      429.      448.      468.
           488.
20 C15  VARNISH
             9.        9.        9.        9.        9.        9.        9.        9.        9.        9.
             9.        9.        9.        9.        9.        9.        9.        9.        9.       10.
            10.       10.       10.       10.       10.       10.       10.       10.       10.       10.
            10.
CUMULATIVE
             9.       18.       26.       35.       44.       53.       62.       71.       80.       89.
            99.      108.      117.      126.      135.      145.      154.      164.      173.      182.
           192.      202.      211.      221.      231.      240.      250.      260.      270.      280.
           290.
20 C16  CHARCOAL PLANTS
             2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
             2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
             2.        2.        2.        2.        2.        2.        2.        2.        2.        2.
             2.
CUMULATIVE
             2.        4.        6.        8.       10.       11.       13.       15.       17.       19.
            21.       23.       25.       27.       29.       30.       32.       34.       36.       38.
            40.       42.       44.       46.       48.       49.       51.       53.       55.       57.
            59.
20 C17  EXPLOSIVE IND (HIGH EXPLOSIVES)
             4.        5.        5.        5.        5.        5.        5.        6.        6.        6.
             6.        6.        6.        7.        7.        7.        7.        8.        8.        8.
             8.        9.        9.       10.       10.       10.       10.       11.       11.       12.
            12.
```

Table B-4. (Cont'd)

```
CUMULATIVE
           4.         9.        14.        18.        23.        28.        34.        39.        45.        50.
          56.        63.        69.        76.        82.        89.        97.       104.       112.       120.
         128.       137.       146.       156.       165.       175.       186.       197.       208.       220.
         232.
20 C18   EXPLOSIVE IND (LOW EXPLOSIVES)
           4.         5.         5.         5.         5.         5.         5.         6.         6.         6.
           6.         7.         7.         7.         7.         8.         8.         8.         8.         9.
           9.         9.         9.        10.        10.        11.        11.        12.        12.        13.
          13.
CUMULATIVE
           4.         9.        14.        19.        24.        29.        35.        40.        46.        52.
          58.        65.        71.        78.        85.        93.       101.       109.       117.       126.
         134.       144.       153.       164.       174.       185.       196.       208.       220.       233.
         245.
20 C19   PRINTING INK PLANTS
          25.        26.        26.        26.        26.        27.        27.        28.        28.        29.
          29.        29.        29.        30.        30.        31.        31.        32.        32.        33.
          33.        34.        34.        35.        35.        37.        37.        38.        38.        39.
          39.
CUMULATIVE
          25.        51.        76.       103.       129.       156.       183.       211.       239.       267.
         296.       325.       355.       385.       415.       447.       478.       510.       542.       576.
         609.       643.       677.       713.       748.       785.       821.       859.       897.       936.
         975.
20 C23   MALEIC ANHYDRIDE

                                                    FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
           0.         0.         1.         1.         1.         2.         2.         2.         2.         3.
           3.         3.         3.         4.         4.         4.         5.         5.         5.         6.
           6.         6.         7.         7.         7.         8.         8.         8.         9.         9.
           9.
20 C24   SODIUM CARBONATE PLANT  (NATURAL PROCESS)
           1.         1.         1.         2.         2.         2.         2.         2.         2.         2.
           2.         2.         2.         2.         2.         3.         3.         3.         3.         3.
           3.         4.         4.         4.         4.         5.         5.         5.         5.         6.
           6.
CUMULATIVE
           1.         3.         4.         5.         7.         9.        10.        12.        14.        16.
          18.        20.        22.        25.        27.        30.        33.        36.        39.        42.
          46.        49.        53.        57.        62.        66.        71.        76.        82.        88.
          94.
20 C25   PHTHALIC ANHYDRIDE PLANTS (NAPTHALENE PROCESS)

                                                    FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
           0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
           0.         0.         0.         0.         0.         0.         0.         0.         1.         1.
           1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
           1.
20 C26   PHTHALIC ANHYDRIDE PLANTS  (OXYLENE PROCESS)
           0.         1.         1.         1.         1.         1.         1.         1.         1.         1.
           1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
           1.         1.         1.         1.         1.         1.         1.         1.         1.         2.
           2.
CUMULATIVE
           0.         1.         2.         2.         3.         3.         4.         4.         5.         6.
```

Table B-4. (Cont'd)

```
            6.          7.          8.          9.         10.         10.         11.         12.         13.         14.
           15.         16.         17.         19.         20.         21.         22.         24.         25.         27.
           28.
20 C27  TEREPHTHALIC ACID PLANTS
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          1.          1.          2.          2.          2.
            2.
CUMULATIVE
            1.          1.          2.          3.          3.          4.          5.          6.          6.          7.
            8.          9.         10.         11.         12.         13.         14.         15.         16.         17.
           18.         20.         21.         22.         24.         25.         27.         28.         30.         31.
           33.
20 C28  DIMETHYL TEREPHTHALATE PLANTS
            0.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.
CUMULATIVE
            0.          1.          2.          2.          3.          3.          4.          4.          5.          6.
            6.          7.          8.          9.          9.         10.         11.         12.         13.         14.
           15.         16.         17.         18.         19.         20.         21.         22.         24.         25.
           26.
20 C30  ETHYL BENZENE

                                    FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
            0.          0.          1.          1.          1.          1.          2.          2.          2.          2.
            2.          3.          3.          3.          4.          4.          4.          4.          5.          5.
            5.          6.          6.          7.          7.          7.          8.          8.          9.          9.
            9.
20 C31  ETHYLENE
            2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
            2.          2.          2.          2.          2.          2.          2.          3.          3.          3.
            3.          3.          3.          3.          3.          3.          3.          3.          3.          4.
            4.
CUMULATIVE
            2.          3.          5.          7.          8.         10.         12.         14.         16.         18.
           20.         22.         24.         26.         29.         31.         33.         36.         38.         41.
           44.         47.         50.         53.         56.         59.         62.         66.         69.         73.
           77.
20 C32  METHANOL PLANTS
            0.          0.          0.          0.          0.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.
CUMULATIVE
            0.          1.          1.          2.          2.          3.          3.          4.          4.          5.
            6.          6.          7.          7.          8.          8.          9.         10.         10.         11.
           12.         12.         13.         14.         14.         15.         16.         16.         17.         18.
           19.
20 C33  PHENOL PLANTS
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
            1.
CUMULATIVE
            1.          1.          2.          2.          3.          4.          4.          5.          5.          6.
            7.          8.          8.          9.         10.         11.         12.         13.         13.         14.
           15.         16.         17.         18.         20.         21.         22.         23.         24.         26.
```

Table B-4. (Cont'd)

```
         27.
20 C34  METHYL METHACRYLATE PLANTS
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        1.
         1.
CUMULATIVE
         0.        1.        1.        1.        1.        2.        2.        2.        3.        3.
         3.        4.        4.        4.        5.        5.        5.        6.        6.        7.
         7.        8.        8.        8.        9.        9.       10.       10.       11.       11.
        12.
20 C35  ETHYLENE GLYCOL DERIVED FROM ETHYLENE OXIDE

                                   FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
         0.        1.        1.        1.        1.        2.        2.        2.        2.        3.
         3.        3.        4.        4.        4.        4.        5.        5.        5.        6.
         6.        6.        7.        7.        7.        8.        8.        8.        9.        9.
         9.
20 C36  PROPYLENE  (OXIDE)
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        0.        0.        1.
         1.
CUMULATIVE
         0.        1.        1.        1.        1.        2.        2.        2.        3.        3.
         3.        4.        4.        4.        5.        5.        5.        6.        6.        7.
         7.        8.        8.        8.        9.        9.       10.       10.       11.       11.
        12.
20 C37  VINYL ACETATE (ETHYLENE)
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        0.        0.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.
CUMULATIVE
         0.        1.        1.        1.        2.        2.        2.        3.        3.        3.
         4.        4.        5.        5.        5.        6.        6.        7.        7.        8.
         9.        9.       10.       10.       11.       12.       13.       13.       14.       15.
        16.
20 C38  CARBON TETRACHLORIDE (METHANE)
         0.        0.        0.        0.        0.        0.        0.        0.        0.        0.
         0.        0.        0.        0.        0.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.
CUMULATIVE
         0.        1.        1.        2.        2.        2.        3.        3.        4.        4.
         4.        5.        5.        6.        6.        7.        7.        8.        8.        9.
        10.       10.       11.       11.       12.       13.       13.       14.       14.       15.
        16.
20 C39  CARBON TETRACHLORIDE  (PROPANE)

                                   FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
         0.        0.        0.        1.        1.        1.        1.        1.        1.        1.
         2.        2.        2.        2.        2.        3.        3.        3.        3.        3.
         4.        4.        4.        4.        4.        5.        5.        5.        5.        6.
         6.
20 C40  CARBON TETRACHORIDE  (CARBON DISULFIDE)
```

Table B-4. (Cont'd)

```
                                                 FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
           0.          0.          0.          1.          1.          1.          1.          1.          1.          1.
           2.          2.          2.          2.          2.          3.          3.          3.          3.          3.
           4.          4.          4.          4.          4.          5.          5.          5.          5.          6.
           6.
20 C41  ACETONE  (CUMENE)
           0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
           0.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.
CUMULATIVE
           0.          1.          1.          2.          2.          3.          3.          4.          4.          4.
           5.          5.          6.          7.          7.          8.          8.          9.          9.         10.
          11.         11.         12.         13.         13.         14.         15.         15.         16.         17.
          18.
20 C42  ACETONE  (ISOPROPANOL)
           0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
           0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
           0.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.
CUMULATIVE
           0.          1.          1.          1.          2.          2.          2.          3.          3.          3.
           4.          4.          5.          5.          6.          6.          6.          7.          7.          8.
           8.          9.          9.         10.         10.         11.         11.         12.         13.         13.
          14.
20 C43  ACETONE  (CYANOHYDRIN)

                                                 FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
           0.          0.          0.          0.          0.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          2.          2.          2.          2.          2.          2.
           2.          3.          3.          3.          3.          3.          3.          3.          4.          4.
           4.
20 C44  METHYL CHLOROFORM
           0.          0.          0.          0.          0.          0.          0.          0.          0.          0.
           0.          0.          0.          0.          0.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.
CUMULATIVE
           0.          1.          1.          1.          2.          2.          3.          3.          4.          4.
           4.          5.          5.          6.          6.          7.          7.          8.          8.          9.
           9.         10.         11.         11.         12.         12.         13.         14.         14.         15.
          16.
20 C45  STYRENE
           0.          0.          0.          0.          0.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.
CUMULATIVE
           0.          1.          1.          2.          2.          3.          3.          4.          4.          5.
           6.          6.          7.          7.          8.          8.          9.         10.         10.         11.
          12.         12.         13.         14.         14.         15.         16.         17.         17.         18.
          19.
20 C46  ALLYL CHLORIDE

                                                 FRACTIONAL GROWTH SOURCE CATEGORY
```

Table B-4. (Cont'd)

```
CUMULATIVE
          0.         0.         0.         0.         0.         0.         0.         1.         1.         1.
          1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
          2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.
20 C47  ACRYLIC ACID
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         0.         0.         1.
         1.
CUMULATIVE
          0.         1.         1.         1.         1.         2.         2.         2.         3.         3.
          3.         4.         4.         4.         5.         5.         5.         6.         6.         7.
          7.         7.         8.         8.         9.         9.        10.        10.        11.        11.
         12.
20 C48  ACETIC ANHYDRIDE
          0.         0.         0.         0.         0.         0.         0.         0.         0.         1.
          1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
          1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.
CUMULATIVE
          0.         1.         1.         2.         2.         3.         3.         4.         4.         5.
          5.         6.         6.         7.         7.         8.         8.         9.        10.        10.
         11.        11.        12.        13.        13.        14.        15.        16.        16.        17.
         18.
20 C49  CYCLOHEXANOL/CYCLOHEXANONE
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         1.         1.         1.         1.         1.
          1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.
CUMULATIVE
          0.         1.         1.         1.         2.         2.         3.         3.         4.         4.
          4.         5.         5.         6.         6.         7.         7.         8.         8.         9.
          9.        10.        11.        11.        12.        12.        13.        14.        14.        15.
         16.
20 D01  SYNTHETIC RUBBER IND.   (STYRENE-BUTADIENE)(SBR)


                                        DECLINING GROWTH SOURCE CATEGORY


20 D02  POLY-BUTADIENE
          0.         0.         0.         0.         0.         0.         0.         0.         0.         0.
          0.         0.         0.         0.         0.         0.         0.         1.         1.         1.
          1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.
CUMULATIVE
          0.         1.         1.         2.         2.         2.         3.         3.         4.         4.
          5.         5.         5.         6.         6.         7.         7.         8.         8.         9.
          9.        10.        10.        11.        12.        12.        13.        13.        14.        15.
         15.
20 D06  ETHYLENE-PROPYLENE
          0.         0.         0.         0.         0.         1.         1.         1.         1.         1.
          1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
          1.         1.         1.         1.         1.         1.         1.         2.         2.         2.
         2.
```

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Table B-4. (Cont'd)

```
CUMULATIVE
         0.         1.         1.         2.         2.         3.         3.         4.         4.         5.
         6.         6.         7.         8.         8.         9.        10.        11.        12.        13.
        14.        15.        16.        17.        19.        20.        22.        23.        25.        26.
        28.
20 D07  SYNTHETIC RUBBER  (NEOPRENE)

                              FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
         0.         0.         0.         1.         1.         1.         1.         1.         1.         1.
         1.         2.         2.         2.         2.         2.         2.         3.         3.         3.
         3.         3.         3.         4.         4.         4.         4.         4.         5.         5.
         5.
21 C11  ETHYLENE OXIDE PLANTS  (AIR OXIDATION PROCESS)
         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.
CUMULATIVE
         1.         2.         3.         4.         5.         6.         7.         8.        10.        11.
        12.        13.        14.        15.        16.        17.        19.        20.        21.        22.
        23.        25.        26.        27.        28.        30.        31.        32.        33.        35.
        36.
21 C13  AMMONIA PLANTS
         4.         4.         4.         4.         4.         4.         4.         5.         5.         5.
         5.         5.         5.         5.         5.         5.         5.         5.         5.         5.
         5.         5.         5.         5.         5.         5.         5.         5.         5.         6.
         5.
CUMULATIVE
         4.         8.        13.        17.        22.        26.        30.        35.        39.        44.
        49.        53.        58.        63.        67.        72.        77.        82.        87.        92.
        97.       102.       107.       112.       118.       123.       128.       134.       139.       145.
       150.
21 C20  FUEL CONVERSION HIGH BTU COAL GASIFICATION

                              FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
         0.         0.         0.         0.         1.         1.         1.         1.         1.         1.
         1.         1.         1.         2.         2.         2.         2.         2.         2.         2.
         2.         2.         3.         3.         3.         3.         3.         3.         3.         3.
         3.
22 C11  ETHYLENE OXIDE PLANTS  (OXYGEN OXIDATION PROCESS)
         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.
CUMULATIVE
         1.         1.         2.         2.         3.         3.         4.         4.         5.         5.
         6.         6.         7.         8.         8.         9.         9.        10.        10.        11.
        12.        12.        13.        13.        14.        15.        15.        16.        17.        17.
        18.
30 A05  NITRATE FERTILIZER  (AMMONIUM NITRATE) PLANTS
         2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.
CUMULATIVE
         2.         4.         6.         9.        11.        13.        15.        17.        19.        21.
```

Table B-4. (Cont'd)

```
        23.        26.        28.        30.        32.        34.        36.        38.        41.        43.
        45.        47.        49.        51.        53.        55.        58.        60.        62.        64.
        66.
30 E01  COTTON GINNING
        27.        27.        27.        27.        27.        27.        27.        27.        27.        27.
        27.        27.        27.        27.        27.        27.        27.        27.        27.        27.
        27.        27.        27.        27.        27.        27.        27.        27.        27.        27.
        27.
CUMULATIVE
        27.        55.        82.       109.       137.       164.       191.       219.       246.       273.
       301.       328.       355.       383.       410.       437.       465.       492.       519.       547.
       574.       601.       629.       656.       683.       711.       738.       765.       793.       820.
       847.
30 E03  ALFALFA DEHYDRATING PLANTS
         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         1.         1.         1.         1.         1.         1.         1.         1.         1.         2.
         2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.
CUMULATIVE
         1.         2.         4.         5.         6.         8.         9.        10.        12.        13.
        14.        16.        17.        19.        20.        21.        23.        24.        26.        27.
        29.        30.        32.        33.        35.        37.        38.        40.        42.        43.
        45.
30 E06  WHISKEY
         7.         7.         7.         7.         7.         7.         7.         7.         7.         7.
         7.         7.         7.         7.         7.         7.         7.         7.         7.         7.
         7.         7.         7.         7.         7.         7.         7.         7.         7.         7.
         7.
CUMULATIVE
         7.        14.        21.        27.        34.        41.        48.        55.        62.        69.
        76.        82.        89.        96.       103.       110.       117.       124.       131.       137.
       144.       151.       158.       165.       172.       179.       186.       192.       199.       206.
       213.
30 E08  BEEF PROCESSING PLANTS
        10.        11.        11.        11.        11.        12.        12.        12.        12.        13.
        13.        14.        14.        14.        14.        15.        15.        16.        16.        17.
        17.        18.        18.        19.        19.        20.        20.        21.        21.        22.
        22.
CUMULATIVE
        10.        21.        32.        43.        54.        66.        78.        90.       103.       116.
       129.       142.       156.       170.       184.       199.       214.       230.       246.       263.
       279.       297.       314.       333.       351.       371.       390.       411.       432.       454.
       475.
30 E10  ANIMAL FEED DEFLUORINATION

                                       FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
         0.         0.         0.         0.         0.         0.         1.         1.         1.         1.
         1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
         2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.
30 E11  VEGETABLE OIL MFG.
         5.         5.         5.         5.         5.         5.         5.         5.         5.         5.
         5.         5.         5.         5.         5.         5.         5.         5.         5.         5.
         5.         5.         5.         5.         5.         5.         5.         5.         5.         5.
         5.
CUMULATIVE
         5.        10.        16.        21.        26.        31.        37.        42.        47.        52.
        58.        63.        68.        73.        79.        84.        89.        94.        99.       105.
       110.       115.       120.       126.       131.       136.       141.       147.       152.       157.
```

Table B-4. (Cont'd)

```
       162.
30 D18  STARCH MFGR
         2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
         2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
         2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
         2.
CUMULATIVE
         2.          5.          7.          9.         11.         14.         16.         18.         20.         23.
        25.         27.         30.         32.         34.         37.         39.         41.         44.         46.
        49.         51.         53.         56.         58.         61.         63.         65.         68.         70.
        73.
30 D20  AMMONIUM SULFATE
         7.          8.          8.          8.          8.          9.          9.         10.         10.         11.
        11.         12.         12.         13.         13.         14.         14.         16.         16.         18.
        18.         19.         19.         21.         21.         24.         24.         26.         26.         29.
        29.
CUMULATIVE
         7.         15.         23.         31.         40.         49.         58.         68.         78.         89.
       100.        112.        124.        138.        151.        165.        180.        196.        211.        229.
       246.        266.        285.        306.        328.        351.        375.        401.        427.        456.
       484.
30 E01  (AGG) FEED AND GRAIN MILL INDUSTRY
       382.        383.        383.        385.        385.        387.        387.        388.        388.        390.
       390.        392.        392.        394.        394.        395.        395.        397.        397.        399.
       399.        401.        401.        403.        403.        405.        405.        407.        407.        409.
       409.
CUMULATIVE
       382.        765.       1148.       1533.       1918.       2304.       2691.       3079.       3468.       3858.
      4248.       4640.       5031.       5425.       5819.       6214.       6610.       7007.       7404.       7803.
      8203.       8604.       9005.       9408.       9811.      10216.      10621.      11028.      11435.      11844.
     12253.
40 A01  STONE QUARRYING AND PROCESSING
        95.         95.         95.         95.         95.         95.         95.         95.         95.         95.
        95.         95.         95.         95.         95.         95.         95.         95.         95.         95.
        95.         95.         95.         95.         95.         95.         95.         95.         95.         95.
        95.
CUMULATIVE
        95.        190.        284.        379.        474.        569.        663.        758.        853.        948.
      1042.       1137.       1232.       1327.       1421.       1516.       1611.       1706.       1800.       1895.
      1990.       2085.       2179.       2274.       2369.       2464.       2558.       2653.       2748.       2843.
      2937.
40 A02  SAND & GRAVEL PROCESS
       114.        114.        114.        114.        114.        114.        114.        114.        114.        114.
       114.        114.        114.        114.        114.        114.        114.        114.        114.        114.
       114.        114.        114.        114.        114.        114.        114.        114.        114.        114.
       114.
CUMULATIVE
       114.        228.        343.        457.        571.        685.        799.        914.       1028.       1142.
      1256.       1370.       1485.       1599.       1713.       1827.       1941.       2056.       2170.       2284.
      2398.       2512.       2627.       2741.       2855.       2969.       3083.       3198.       3312.       3426.
      3540.
40 D06  FIBERGLASS MFG. PLANTS  (TEXTILE PROCESSING)
         0.          0.          0.          0.          0.          1.          1.          1.          1.          1.
         1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
         1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
         1.
CUMULATIVE
         0.          1.          1.          2.          2.          3.          3.          4.          5.          5.
         6.          6.          7.          7.          8.          9.          9.         10.         11.         12.
        12.         13.         14.         15.         15.         16.         17.         18.         19.         20.
        21.
40 D07  GLASS MANUFACTURING INDUSTRY  (SODA-LIME GLASS)
```

Table B-4. (Cont'd)

```
        12.        12.        12.        12.        12.        12.        12.        12.        12.        12.
        12.        12.        12.        12.        12.        12.        12.        12.        12.        12.
        12.        12.        12.        12.        12.        12.        12.        12.        12.        12.
        12.
CUMULATIVE
        12.        23.        35.        47.        58.        70.        81.        93.       105.       116.
       128.       140.       151.       163.       174.       186.       198.       209.       221.       233.
       244.       256.       268.       279.       291.       302.       314.       326.       337.       349.
       361.
40 D08  (AGG) CASTABLE REFRACTORY PLANTS
         5.         5.         5.         5.         5.         5.         5.         5.         5.         5.
         5.         6.         6.         6.         6.         6.         6.         6.         6.         6.
         6.         6.         6.         7.         7.         7.         7.         7.         7.         7.
         7.
CUMULATIVE
         5.        10.        14.        19.        24.        30.        35.        40.        45.        51.
        56.        61.        67.        73.        78.        84.        90.        96.       102.       108.
       114.       120.       127.       133.       140.       147.       153.       160.       167.       174.
       181.
40 D10  CERAMIC CLAY MFG
       112.       112.       112.       112.       112.       112.       112.       112.       112.       112.
       112.       112.       112.       112.       112.       112.       112.       112.       112.       112.
       112.       112.       112.       112.       112.       112.       112.       112.       112.       112.
       112.
CUMULATIVE
       112.       223.       335.       447.       558.       670.       782.       893.      1005.      1117.
      1228.      1340.      1452.      1563.      1675.      1787.      1898.      2010.      2122.      2233.
      2345.      2457.      2568.      2680.      2792.      2903.      3015.      3127.      3238.      3350.
      3462.
40 D11  GYPSUM MANUFACTURING PLANTS  (CALCINER)
         5.         5.         5.         5.         5.         5.         5.         5.         5.         5.
         5.         5.         5.         5.         5.         5.         5.         5.         5.         5.
         5.         5.         5.         5.         5.         5.         5.         5.         5.         5.
         5.
CUMULATIVE
         5.         9.        14.        19.        23.        27.        32.        36.        41.        46.
        50.        55.        59.        64.        68.        73.        78.        82.        87.        91.
        96.       100.       105.       109.       114.       119.       123.       128.       132.       137.
       141.
40 D12  PERLITE  (VERTICAL FURNACE)
         3.         3.         3.         3.         3.         3.         3.         3.         3.         3.
         3.         3.         3.         3.         3.         3.         3.         3.         3.         3.
         3.         3.         3.         3.         3.         3.         3.         3.         3.         3.
         3.
CUMULATIVE
         3.         6.        10.        13.        16.        19.        23.        26.        29.        32.
        35.        39.        42.        45.        48.        52.        55.        58.        61.        64.
        68.        71.        74.        77.        81.        84.        87.        90.        93.        97.
       100.
40 D13  MINERAL WOOL MFG
         2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.
CUMULATIVE
         2.         5.         7.        10.        12.        14.        17.        19.        22.        24.
        26.        29.        31.        33.        36.        38.        41.        43.        45.        48.
        50.        53.        55.        57.        60.        62.        65.        67.        69.        72.
        74.
40 D14  FIBERGLASS MFG. PLANTS  (WOOL PROCESSING)
         2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
         2.         2.         2.         2.         2.         2.         2.         3.         3.         3.
```

Table B-4. (Cont'd)

```
            3.         3.         3.         3.         3.         3.         3.         4.         4.         4.
            4.
CUMULATIVE
            2.         3.         5.         7.         8.        10.        12.        14.        16.        18.
           20.        22.        25.        27.        29.        32.        34.        37.        39.        42.
           45.        48.        51.        54.        57.        60.        64.        67.        71.        75.
           78.
40 D16  (AGG) CLAY SINTERING PLANTS

                                       FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
            0.         0.         0.         1.         1.         1.         1.         1.         1.         1.
            2.         2.         2.         2.         2.         2.         2.         2.         3.         3.
            3.         3.         3.         3.         3.         4.         4.         4.         4.         4.
            4.
40 D17  FLY-ASH SINTERING  (SINTERING)

                                       FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
            0.         0.         1.         1.         1.         2.         2.         2.         2.         3.
            3.         3.         4.         4.         4.         5.         5.         5.         6.         6.
            6.         7.         7.         7.         8.         8.         9.         9.         9.        10.
           10.
40 D18  GLASS MANUFACTURING INDUSTRY  (LEAD GLASS)
            4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
            4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
            4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
            4.
CUMULATIVE
            4.         8.        12.        16.        19.        23.        27.        31.        35.        39.
           43.        47.        51.        55.        58.        62.        66.        70.        74.        78.
           82.        86.        90.        94.        97.       101.       105.       109.       113.       117.
          121.
41 E01  (AGG) ASPHALT ROOFING PLANTS
            7.         7.         7.         7.         7.         7.         7.         7.         7.         7.
            7.         7.         7.         7.         7.         7.         7.         7.         7.         7.
            7.         7.         7.         7.         7.         7.         7.         7.         7.         7.
            7.
CUMULATIVE
            7.        14.        21.        28.        35.        42.        48.        55.        62.        69.
           76.        83.        90.        97.       104.       111.       118.       125.       132.       139.
          145.       152.       159.       166.       173.       180.       187.       194.       201.       208.
          215.
41 E01  (AGG) PHOSPHATE ROCK PREPARATION PLANTS
           16.        16.        16.        16.        16.        16.        16.        16.        16.        16.
           16.        16.        16.        16.        16.        16.        16.        16.        16.        16.
           16.        16.        16.        16.        16.        16.        16.        16.        16.        16.
           16.
CUMULATIVE
           16.        33.        49.        66.        82.        99.       115.       132.       148.       165.
          181.       197.       214.       230.       247.       263.       280.       296.       313.       329.
          346.       362.       378.       395.       411.       428.       444.       461.       477.       494.
          510.
41 F01  METALIC MINERALS MINING (IRON ORE)
            4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
            4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
            4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
            4.
```

Table B-4. (Cont'd)

```
CUMULATIVE
         4.        7.       11.       14.       18.       21.       25.       28.       32.       35.
        39.       42.       46.       49.       53.       57.       60.       64.       67.       71.
        74.       78.       81.       85.       88.       92.       95.       99.      102.      106.
       110.
41 F01  (AGG) NON-METALLIC MINING - CLAY


                              DECLINING GROWTH SOURCE CATEGORY


42 E01  METALIC MINERALS MINING (FERROALLOY)
         3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
         3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
         3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
         3.
CUMULATIVE
         3.        5.        8.       10.       13.       16.       19.       21.       24.       27.
        30.       33.       35.       38.       41.       44.       47.       50.       53.       56.
        59.       63.       66.       69.       72.       76.       79.       82.       86.       89.
        92.
42 E01  (AGG) NON-METALLIC MINING - GYPSUM
         3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
         3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
         3.        3.        3.        3.        3.        3.        3.        3.        3.        3.
         3.
CUMULATIVE
         3.        6.        9.       12.       14.       17.       20.       23.       26.       29.
        32.       35.       39.       42.       45.       48.       51.       54.       57.       61.
        64.       67.       70.       74.       77.       80.       84.       87.       91.       94.
        98.
42 E01  METALIC MINERALS MINING (COPPER)
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.        1.        1.        1.        1.        1.        1.        1.        1.        1.
         1.
CUMULATIVE
         1.        3.        4.        5.        6.        8.        9.       10.       11.       13.
        14.       15.       17.       18.       19.       21.       22.       23.       25.       26.
        27.       28.       30.       32.       33.       34.       36.       37.       39.       40.
        42.
43 E01  (AGG) NON-METALLIC MINING - LIME
         4.        4.        4.        4.        4.        4.        4.        4.        4.        4.
         4.        4.        4.        5.        5.        5.        5.        5.        5.        5.
         5.        5.        5.        5.        5.        5.        5.        5.        5.        5.
         5.
CUMULATIVE
         4.        8.       13.       17.       21.       26.       30.       34.       39.       43.
        48.       52.       57.       61.       66.       70.       75.       80.       84.       89.
        94.       99.      103.      108.      113.      118.      123.      128.      133.      139.
       143.
44 E01  METALIC MINERALS MINING (LEAD MINING)
         6.        6.        6.        6.        6.        6.        6.        6.        6.        6.
         6.        6.        6.        6.        6.        6.        6.        6.        6.        6.
         6.        6.        6.        6.        6.        6.        6.        6.        6.        6.
         6.
CUMULATIVE
         6.       11.       17.       23.       28.       34.       40.       46.       51.       57.
```

Table B-4. (Cont'd)

```
          63.        68.        74.        80.        85.        91.        97.       103.       108.       114.
         120.       125.       131.       137.       142.       148.       154.       159.       165.       171.
         177.
44 F01  PHOSPHATE ROCK (MINING)
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.
CUMULATIVE
           2.         3.         5.         7.         8.        10.        12.        13.        15.        17.
          18.        20.        22.        23.        25.        27.        28.        30.        31.        33.
          35.        36.        38.        40.        41.        43.        45.        46.        48.        50.
          51.
45 D10  (AGG)  TUNNEL KILNS(GAS),DRYERS AND STORAGE
          22.        22.        22.        22.        22.        22.        22.        22.        22.        22.
          22.        22.        22.        22.        22.        22.        22.        22.        22.        22.
          22.        22.        22.        22.        22.        22.        22.        22.        22.        22.
          22.
CUMULATIVE
          22.        44.        66.        88.       110.       132.       154.       176.       198.       220.
         242.       264.       286.       308.       330.       352.       374.       396.       418.       440.
         462.       484.       506.       528.       550.       572.       594.       616.       638.       660.
         682.
45 D11  (AGG)  TUNNEL KILNS(OIL),DRYERS AND STORAGE
           6.         6.         6.         6.         6.         6.         6.         6.         6.         6.
           6.         6.         6.         6.         6.         6.         6.         6.         6.         6.
           6.         6.         6.         6.         6.         6.         6.         6.         6.         6.
           6.
CUMULATIVE
           6.        12.        18.        23.        29.        35.        41.        47.        53.        59.
          64.        70.        76.        82.        88.        94.       100.       105.       111.       117.
         123.       129.       135.       141.       146.       152.       158.       164.       170.       176.
         182.
45 D12  (AGG)  TUNNEL KILNS(COAL),DRYERS AND STORAGE
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.
CUMULATIVE
           2.         4.         6.         8.        10.        12.        13.        15.        17.        19.
          21.        23.        25.        27.        29.        31.        33.        35.        36.        38.
          40.        42.        44.        46.        48.        50.        52.        54.        56.        58.
          60.
45 E01  METALIC MINERALS MINING (ZINC MINE & CRUSHING)


                                        DECLINING GROWTH SOURCE CATEGORY


45 F01  (AGG) NON-METALLIC MINING - BORON COMPOUNDS

                                        FRACTIONAL GROWTH SOURCE CATEGORY


CUMULATIVE
           0.         1.         1.         1.         1.         2.         2.         2.         3.         3.
           3.         4.         4.         4.         5.         5.         5.         6.         6.         7.
           7.         7.         8.         8.         9.         9.         9.        10.        10.        11.
```

Table B-4. (Cont'd)

```
          11.
46 D10    (AGG)  PERIODIC KILNS(GAS),DRYERS AND STORAGE
           7.         7.         7.         7.         7.         7.         7.         7.         7.         7.
           7.         7.         7.         7.         7.         7.         7.         7.         7.         7.
           7.         7.         7.         7.         7.         7.         7.         7.         7.         7.
           7.
CUMULATIVE
           7.        15.        22.        30.        37.        44.        52.        59.        67.        74.
          81.        89.        96.       103.       111.       118.       126.       133.       140.       148.
         155.       163.       170.       177.       185.       192.       200.       207.       214.       222.
         229.
46 D11    (AGG)  PERIODIC KILNS(OIL), DRYERS AND STORAGE
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
           2.
CUMULATIVE
           2.         4.         6.         8.        10.        12.        13.        15.        17.        19.
          21.        23.        25.        27.        29.        31.        33.        35.        36.        38.
          40.        42.        44.        46.        48.        50.        52.        54.        56.        58.
          60.
46 D12    (AGG)  PERIODIC KILNS(COAL),DRYERS AND STORAGE

                                     FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
           0.         1.         1.         2.         2.         3.         3.         4.         4.         5.
           5.         6.         6.         7.         7.         8.         8.         9.         9.        10.
          10.        11.        11.        12.        12.        12.        13.        13.        14.        14.
          15.
46 E01    METALIC MINERALS MINING (ALUMINUM)
           4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
           4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
           4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
           4.
CUMULATIVE
           4.         7.        11.        15.        19.        22.        26.        30.        34.        37.
          41.        45.        48.        52.        56.        60.        63.        67.        71.        74.
          78.        82.        86.        89.        93.        97.       101.       104.       108.       112.
         115.
47 E01    METALIC MINERALS MINING (URANIMUN)
           1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
           1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
           1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
           1.
CUMULATIVE
           1.         1.         2.         2.         3.         3.         4.         4.         5.         5.
           6.         7.         7.         8.         8.         9.         9.        10.        10.        11.
          11.        12.        13.        13.        14.        14.        15.        15.        16.        16.
          17.
47 F01    (AGG)  NON-METALLIC MINING - FLUORSPAR
           1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
           1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
           1.         1.         1.         2.         2.         2.         2.         2.         2.         2.
           2.
CUMULATIVE
           1.         2.         4.         5.         6.         7.         8.        10.        11.        12.
          14.        15.        16.        18.        19.        20.        22.        23.        25.        26.
          27.        29.        30.        32.        33.        35.        37.        38.        40.        42.
          43.
50 A10    BY-PRODUCT COKE OVEN
```

Table B-4. (Cont'd)

```
           2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
           2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
           2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
           2.
CUMULATIVE
           2.          4.          6.          8.         10.         12.         14.         16.         18.         19.
          21.         23.         25.         27.         29.         31.         33.         35.         37.         39.
          41.         43.         45.         47.         49.         51.         53.         54.         56.         58.
          60.
50 C02  GREY IRON FOUNDRIES   (ELECTRIC ARC)
           5.          5.          5.          5.          5.          5.          5.          5.          5.          5.
           5.          5.          5.          5.          5.          5.          5.          5.          5.          5.
           5.          5.          5.          5.          5.          5.          5.          5.          5.          5.
           5.
CUMULATIVE
           5.         10.         16.         21.         26.         31.         37.         42.         47.         52.
          58.         63.         68.         73.         79.         84.         89.         94.         99.        105.
         110.        115.        120.        126.        131.        136.        141.        147.        152.        157.
         162.
50 C03  GREY IRON FOUNDRIES   (REVERBERATORY)
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.          1.          1.          1.          1.          1.          1.          1.          1.          1.
           1.
CUMULATIVE
           1.          1.          2.          3.          3.          4.          5.          5.          6.          7.
           8.          8.          9.         10.         10.         11.         12.         12.         13.         14.
          14.         15.         16.         16.         17.         18.         19.         19.         20.         21.
          21.
50 C04  GREY IRON FOUNDRIES   (CUPOLA)
```

DECLINING GROWTH SOURCE CATEGORY

```
50 D01  STEEL FOUNDRIES   (ELECTRIC ARC)
          29.         29.         29.         29.         29.         29.         29.         29.         29.         29.
          29.         29.         29.         29.         29.         29.         29.         29.         29.         29.
          29.         29.         29.         29.         29.         29.         29.         29.         29.         29.
          29.
CUMULATIVE
          29.         57.         86.        114.        143.        171.        200.        229.        257.        286.
         314.        343.        371.        400.        429.        457.        486.        514.        543.        571.
         600.        629.        657.        686.        714.        743.        771.        800.        829.        857.
         886.
50 D02  STEEL FOUNDRIES   (OPEN HEARTH)
           3.          3.          3.          3.          3.          3.          3.          3.          3.          3.
           3.          3.          3.          3.          3.          3.          3.          3.          3.          3.
           3.          3.          3.          3.          3.          3.          3.          3.          3.          3.
           3.
CUMULATIVE
           3.          6.         10.         13.         16.         19.         22.         25.         29.         32.
          35.         38.         41.         44.         48.         51.         54.         57.         60.         64.
          67.         70.         73.         76.         79.         83.         86.         89.         92.         95.
          98.
50 F01  URANIUM REFINING
           4.          4.          4.          4.          4.          4.          4.          4.          4.          4.
           4.          4.          4.          4.          4.          4.          4.          4.          4.          4.
```

Table B-4. (Cont'd)

```
             4.         4.         4.         4.         4.         4.         4.         4.         4.         4.
             4.
CUMULATIVE
             4.         8.        12.        16.        20.        25.        29.        33.        37.        41.
            45.        49.        53.        57.        61.        65.        70.        74.        78.        82.
            86.        90.        94.        98.       102.       106.       110.       114.       119.       123.
           127.
51 E12   (AGG) SECONDARY ALUMINUM PLANTS
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.
CUMULATIVE
             1.         3.         4.         5.         6.         8.         9.        10.        11.        13.
            14.        15.        17.        18.        19.        20.        22.        23.        24.        25.
            27.        28.        29.        31.        32.        33.        34.        36.        37.        38.
            39.
51 E01   (AGG) SECONDARY ZINC SMELTERS (RETORT REDUCTION & KETTLE FURNACES)
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.
CUMULATIVE
             1.         2.         2.         3.         4.         5.         6.         7.         7.         8.
             9.        10.        11.        12.        12.        13.        14.        15.        16.        17.
            18.        19.        19.        20.        21.        22.        23.        24.        25.        26.
            27.
51 E02   (AGG) SECONDARY ZINC SMELTERS (HORIZ & REVERB FURNACES)
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.
CUMULATIVE
             1.         2.         2.         3.         4.         5.         6.         7.         7.         8.
             9.        10.        11.        12.        12.        13.        14.        15.        16.        17.
            18.        19.        19.        20.        21.        22.        23.        24.        25.        26.
            27.
55 A01   PESTICIDES MANUFACTURING
             1.         1.         1.         1.         1.         1.         1.         1.         1.         2.
             2.         2.         2.         2.         2.         2.         2.         2.         2.         2.
             2.         2.         2.         2.         2.         2.         2.         2.         2.         3.
             3.
CUMULATIVE
             1.         3.         4.         5.         6.         8.         9.        11.        12.        14.
            15.        17.        18.        20.        22.        24.        25.        27.        29.        31.
            33.        35.        37.        39.        41.        44.        46.        48.        51.        53.
            56.
57 B01   (AGG) SECONDARY COPPER PLANTS (BLAST FURNACE)

                                       FRACTIONAL GROWTH SOURCE CATEGORY

CUMULATIVE
             0.         1.         1.         2.         2.         3.         3.         4.         4.         5.
             5.         5.         6.         6.         7.         7.         8.         8.         9.         9.
            10.        10.        11.        11.        11.        12.        12.        13.        13.        14.
            14.
58 B01   (AGG) SECONDARY COPPER PLANTS (CONVERTER SMELTING)
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.         1.         1.         1.         1.         1.         1.         1.         1.         1.
             1.
```

Table B-4. (Cont'd)

```
CUMULATIVE
          1.          1.          2.          3.          3.          4.          4.          5.          6.          6.
          7.          8.          8.          9.         10.         10.         11.         11.         12.         13.
         13.         14.         15.         15.         16.         17.         17.         18.         19.         19.
         20.
60 E01  DRY CLEANING
        334.        335.        335.        335.        335.        336.        336.        336.        336.        337.
        337.        337.        337.        337.        337.        338.        338.        338.        338.        339.
        339.        339.        339.        340.        340.        340.        340.        341.        341.        342.
        342.
CUMULATIVE
        334.        669.       1004.       1339.       1674.       2009.       2345.       2681.       3017.       3354.
       3690.       4027.       4364.       4702.       5039.       5377.       5715.       6054.       6392.       6731.
       7070.       7409.       7749.       8089.       8429.       8769.       9110.       9451.       9792.      10133.
      10475.
60 B04  GRAPHIC ARTS INDUSTRY  (GRAVURE)
         11.         12.         12.         12.         12.         12.         12.         13.         13.         13.
         13.         13.         13.         14.         14.         14.         14.         15.         15.         15.
         15.         16.         16.         16.         16.         17.         17.         17.         17.         18.
         18.
CUMULATIVE
         11.         23.         35.         47.         59.         71.         84.         96.        109.        122.
        135.        149.        162.        176.        190.        204.        219.        233.        248.        263.
        279.        294.        310.        326.        342.        359.        376.        393.        410.        428.
        446.
60 B05  GRAPHIC ARTS INDUSTRY  (FLEXOGRAPHY)
          7.          7.          7.          7.          7.          7.          7.          7.          7.          7.
          7.          8.          8.          8.          8.          8.          8.          8.          8.          9.
          9.          9.          9.          9.          9.         10.         10.         10.         10.         10.
         10.
CUMULATIVE
          7.         13.         20.         27.         34.         41.         48.         55.         62.         70.
         77.         85.         93.        101.        108.        117.        125.        133.        142.        150.
        159.        168.        177.        186.        195.        205.        214.        224.        234.        244.
        254.
60 B07  GRAPHIC  ARTS INDUSTRY  (LETTERPRESS)
         35.         36.         36.         37.         37.         38.         38.         39.         39.         40.
         40.         41.         41.         43.         43.         44.         44.         45.         45.         47.
         47.         48.         48.         50.         50.         51.         51.         53.         53.         55.
         55.
CUMULATIVE
         35.         71.        107.        144.        182.        220.        258.        297.        336.        376.
        416.        458.        499.        542.        585.        629.        673.        718.        763.        810.
        857.        905.        953.       1003.       1053.       1104.       1156.       1209.       1262.       1317.
       1372.
60 F03  P.T.M. ID.  (SHIP & BARGE TRANSFER, GAS. & CRUDE OIL)
          2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
          2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
          2.          2.          2.          2.          2.          3.          3.          3.          3.          3.
          3.
CUMULATIVE
          2.          4.          6.          7.          9.         11.         13.         15.         17.         19.
         21.         24.         26.         28.         30.         32.         34.         37.         39.         41.
         44.         46.         49.         51.         54.         56.         59.         61.         64.         67.
         69.
60 F04  P.T.M. ID.  (BULK GAS. TERMINALS) LOADING TANK TRUCKS/RR CAR
         13.         14.         14.         14.         14.         14.         14.         14.         14.         14.
         14.         14.         14.         15.         15.         15.         15.         15.         15.         15.
         15.         15.         15.         15.         15.         16.         16.         16.         16.         16.
         16.
CUMULATIVE
         13.         27.         41.         54.         68.         82.         96.        110.        124.        138.
```

Table B-4. (Cont'd)

```
         152.        166.        181.        195.        210.        224.        239.        254.        269.        284.
         299.        314.        329.        345.        360.        376.        392.        408.        423.        440.
         456.
61 B02  INDUSTRIAL SURFACE COATING  (LARGE APPLIANCE COATING)
          14.         15.         15.         16.         16.         17.         17.         18.         18.         19.
          19.         20.         20.         21.         21.         22.         22.         24.         24.         25.
          25.         26.         26.         28.         28.         30.         30.         32.         32.         34.
          34.
CUMULATIVE
          14.         30.         45.         61.         77.         94.        111.        128.        146.        165.
         184.        203.        223.        244.        265.        287.        309.        333.        356.        381.
         406.        413.        459.        487.        515.        545.        575.        607.        639.        673.
         707.
61 B03  INDUSTRIAL SURFACE COATING  (MAGNET WIRE COATING)
          10.         11.         11.         11.         11.         12.         12.         12.         12.         13.
          13.         14.         14.         15.         15.         15.         15.         16.         16.         17.
          17.         18.         18.         20.         20.         21.         21.         22.         22.         24.
          24.
CUMULATIVE
          10.         21.         31.         42.         53.         65.         77.         89.        102.        115.
         128.        141.        155.        170.        184.        200.        215.        231.        248.        265.
         282.        301.        319.        339.        358.        379.        400.        422.        444.        468.
         492.
62 B02  INDUSTRIAL SURFACE COATING  (AUTOMOBILES)
           2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
           2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
           2.          2.          2.          2.          2.          2.          2.          3.          3.          3.
           3.
CUMULATIVE
           2.          4.          6.          8.         11.         13.         15.         17.         19.         22.
          24.         26.         28.         31.         33.         35.         38.         40.         42.         45.
          47.         49.         52.         54.         57.         59.         62.         64.         67.         69.
          72.
62 B03  INDUSTRIAL SURFACE COATING  (CAN COATING)
           2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
           2.          2.          2.          2.          2.          3.          3.          3.          3.          3.
           3.          3.          3.          3.          3.          4.          4.          4.          4.          4.
           4.
CUMULATIVE
           2.          3.          5.          7.          9.         11.         13.         15.         17.         19.
          22.         24.         26.         29.         31.         34.         36.         39.         42.         45.
          48.         51.         54.         57.         61.         64.         68.         72.         75.         79.
          83.
63 B02  INDUSTRIAL SURFACE COATING  (METAL COILS COATING)
           3.          3.          3.          3.          3.          3.          3.          3.          3.          4.
           4.          4.          4.          4.          4.          4.          4.          4.          4.          5.
           5.          5.          5.          5.          5.          6.          6.          6.          6.          6.
           6.
CUMULATIVE
           3.          6.          8.         11.         14.         18.         21.         24.         28.         31.
          35.         38.         42.         46.         50.         54.         58.         63.         67.         72.
          77.         82.         87.         92.         97.        103.        108.        114.        120.        127.
         133.
63 B03  INDUSTRIAL SURFACE COATING  (PAPER COATING)
           2.          2.          2.          2.          2.          2.          2.          2.          2.          2.
           2.          2.          2.          2.          2.          3.          3.          3.          3.          3.
           3.          3.          3.          3.          3.          3.          3.          4.          4.          4.
           4.
CUMULATIVE
           2.          3.          5.          7.          9.         11.         13.         15.         17.         19.
          21.         23.         26.         28.         30.         33.         36.         38.         41.         44.
          47.         50.         53.         56.         59.         63.         66.         70.         73.         77.
```

Table B-4. (Cont'd)

```
         61.
64 B02  INDUSTRIAL SURFACE COATING  (FABRIC COATING)
         11.        12.        12.        12.        12.        13.        13.        14.        14.        15.
         15.        15.        15.        16.        16.        17.        17.        18.        18.        19.
         19.        21.        21.        22.        22.        23.        23.        25.        25.        26.
         26.
CUMULATIVE
         11.        23.        35.        47.        60.        73.        86.       100.       114.       128.
        143.       156.       174.       190.       206.       224.       241.       259.       278.       297.
        316.       337.       358.       380.       402.       425.       448.       473.       498.       524.
        551.
70 F01  GASCLINE ADDITIVES  (SODIUM-LEAD)


                                        DECLINING GROWTH SOURCE CATEGORY


70 F02  GASCLINE ADDITIVES  (ELECTROLYTIC)


                                   DECLINING GROWTH SOURCE CATEGORY


71 D01  (AGG) PETROLEUM REFINERY MISC. SOURCES
          9.         9.         9.         9.         9.        10.        10.        10.        10.        10.
         10.        11.        11.        11.        11.        11.        11.        12.        12.        12.
         12.        12.        12.        13.        13.        13.        13.        14.        14.        14.
         14.
CUMULATIVE
          9.        18.        27.        36.        46.        55.        65.        75.        85.        95.
        105.       116.       126.       137.       148.       159.       171.       182.       194.       206.
        218.       231.       243.       256.       269.       282.       295.       309.       323.       337.
        352.
71 E01  (AGG) CRUDE OIL AND NATURAL GAS PRODUCTION PLANTS
         15.        16.        16.        16.        16.        16.        16.        16.        16.        17.
         17.        17.        17.        17.        17.        17.        17.        18.        18.        18.
         18.        18.        18.        19.        19.        19.        19.        19.        19.        20.
         20.
CUMULATIVE
         15.        31.        46.        62.        78.        94.       110.       126.       142.       159.
        175.       192.       209.       226.       243.       260.       278.       295.       313.       331.
        349.       367.       386.       404.       423.       442.       461.       480.       499.       519.
        539.
80 A03  CHEMICAL WOOD IND.  (NSSC)
          3.         3.         3.         3.         3.         3.         3.         3.         3.         3.
          3.         3.         3.         3.         3.         3.         3.         3.         3.         3.
          3.         3.         3.         3.         3.         3.         3.         3.         3.         3.
          3.
CUMULATIVE
          3.         5.         8.        11.        13.        16.        19.        21.        24.        27.
         29.        32.        35.        37.        40.        43.        46.        48.        51.        54.
         56.        59.        62.        64.        67.        70.        72.        75.        78.        80.
         83.
80 A04  CHEMICAL WOOD PULPING IND.  (ACID SULFITE)
```

Table B-4. (Cont'd)

FRACTIONAL GROWTH SOURCE CATEGORY

```
CUMULATIVE
        0.         1.         1.         2.         2.         3.         3.         3.         4.         4.
        5.         5.         6.         6.         7.         7.         7.         8.         8.         9.
        9.        10.        10.        10.        11.        11.        12.        12.        13.        13.
       14.
80 P01  PLYWOOD MANUFACTURING PLANT
        9.         9.         9.        10.        10.        10.        10.        10.        10.        10.
       10.        11.        11.        11.        11.        11.        11.        11.        11.        12.
       12.        12.        12.        12.        12.        13.        13.        13.        13.        14.
       14.
CUMULATIVE
        9.        19.        28.        38.        48.        58.        67.        78.        88.        98.
      108.   .   119.       130.       141.       152.       163.       174.       185.       197.       209.
      220.       233.       245.       257.       270.       282.       295.       308.       321.       335.
      348.
90 F02  TEXTILE MFG (HEAT SETTING/FINISHING)
        7.         7.         7.         8.         8.         8.         8.         8.         8.         9.
        9.         9.         9.        10.        10.        11.        11.        11.        11.        12.
       12.        13.        13.        14.        14.        15.        15.        16.        16.        17.
       17.
CUMULATIVE
        7.        14.        21.        29.        36.        44.        52.        60.        69.        78.
       88.        96.       105.       115.       125.       136.       146.       158.       169.       181.
      193.       206.       219.       232.       246.       260.       275.       290.       306.       322.
      339.
```

APPENDIX C

ESTIMATES OF MAXIMUM EXPECTED SHORT-TERM (1-24 HOUR) AND LONG-TERM (ANNUAL) GROUND LEVEL CONCENTRATIONS FROM SINGLE AND MULTIPLE SOURCES

C.1 SHORT-TERM ESTIMATES

Estimates of the maximum expected short-term ground level pollutant concentration due to a single source are based upon the familiar Gaussian-plume model.[14] This model is appropriate for use with primary conservative pollutants and relatively short source-receptor distances.

According to this model, the ground level concentration below the plume centerline is given by the following equation:

$$\chi(x) = \frac{Qx10^6}{\pi u \sigma_y \sigma_z} \exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^2\right] \tag{1}$$

in which:

$\chi(x)$ = ground level centerline pollutant concentration at a distance x from the source, (micrograms/cubic meter):

Q = emission rate (grams/second);

u = wind speed (meters/second);

σ_y = horizontal dispersion coeffieient, a function of x (meters);

σ_z = vertical dispersion coefficient, a function of x (meters);

H = effective stack height (meters), given by the sum of the physical stack height h_s and the estimated plume rise Δh.

Of specific interest is the maximum ground level concentration. In order to derive an analytic expression for the estimated maximum concentration, the following commonly used representations of the horizontal and vertical coefficients were used:

$$\sigma_y(x) = ax^b \tag{2}$$

$$\sigma_z(x) = cx^d \tag{3}$$

The quantities a, b, c, and d depend upon the atmospheric stability class corresponding to the meteorological conditions of interest. Given these representations, the following expressions for the estimated maximum concentration χ_m and the corresponding downwind distance x_m may be derived:[17]

$$\chi_m = \frac{AQ\text{x}10^6}{\pi u} \; \frac{1}{H^{2\alpha}} \tag{4}$$

and

$$x_m = \left[\left(\frac{H}{c}\right)^2 \; \frac{1}{2\alpha}\right]^{1/2d} \tag{5}$$

with $\alpha = \frac{b+d}{2d}$ (6)

and

$$A = \frac{c^{2\alpha-1}}{a} \; (2\alpha)^{\alpha} \exp\,(-\alpha) \tag{7}$$

Table 1 gives the values of the parameters a, b, c and d as well as the values of the quantity A for moderately unstable, neutral, and moderately stable conditions.

χ_m depends upon the stability class and the wind speed, the wind speed dependence being due not only to the explicit factor of 1/u in the equation but also to the fact that the plume rise and therefore the effective stack height depends upon u. The plume rise is estimated using the formulas of Briggs (1972, 1975):

- Neutral/unstable:
  $\Delta h = 1.6F^{1/3}u^{-1}\xi^{2/3}$ (8)

where:

$F = g\left(\frac{T-Ta}{T}\right) V$

g = acceleration of gravity (9.8 m/sec^2);

T = exit gas temperature (Kelvin);

T_a = ambient atmospheric temperature (Kelvin);

V = exit gas flow rate at temperature T; (cubic meters/second);

u = wind speed;

$\xi = 3.5\, x^*$

$x^* = 14F^{5/8}$ for $F<55$ m^4/sec^3

$x^* = 34F^{2/5}$ for $F>55$ m^4/sec^3

Table 1. Dispersion Coefficient Parameters and Maximum Concentration Coefficient

Atmospheric Stability	Moderately Unstable	Neutral	Moderately Stable
Corresponding Pasquill-Gifford Stability Class	B	D	E-F (intermediate)
a*	0.351	0.150	0.0853
b*	0.867	0.889	0.894
c**,†	0.139, 0.0494, 0.0494	0.0856, 0.259, 0.737	0.0682, 0.227, 1.437
d**,†	0.947, 1.114, 1.114	0.865, 0.687, 0.564	0.814, 0.618, 0.401
A†	0.335, 0.188, 0.188	0.396, 0.955, 3.85	0.468, 1.21, 34.7

*Estimated from Fig. 3.2, Ref. 14.

**Taken from Table 5, Ref. 18.

†The first numbers given for each stability are appropriate at distances between 100 and 500 m, the second numbers at distances between 500 and 5000 m, and the third numbers at distances greater than 5000 m.

- **Stable:**

$$\Delta h = 2.6 \left(\frac{F}{us}\right)^{1/3} \tag{9}$$

with $s = \frac{g}{T_a} \frac{\partial \Theta}{\partial z}$

$\frac{\partial \Theta}{\partial z}$ = ambient potential temperature lapse rate; a value of 0.5°K/100m was assumed as being representative of moderately stable conditions.

For the neutral/unstable case, the plume rise estimate may be written in the form:

$$\Delta h = \frac{C}{u} \tag{10}$$

with $C = 1.6F^{1/3}\xi^{2/3}$

i.e. $C = 21F^{3/4}\text{m}^2/\text{sec}$ for $F<55\text{m}^4/\text{sec}^3$

and $C = 39F^{3/5}\text{m}^2/\text{sec}$ for $F>55\text{m}^4/\text{sec}^3$

In the stable case, the plume rise estimate becomes

$$\Delta h = \frac{D}{u^{1/3}} \tag{11}$$

with $D = 47F^{1/3}$ assuming an ambient temperature of 20°C = 293°K and

$\partial\Theta/\partial z = 0.5$°K/100m.

In order to estimate X_m an appropriate value of the wind speed must be selected. The value corresponding to the worst case is that which maximizes X_m. For neutral and unstable conditions, $X_m(u)$ has the following form:

$$X_m(u) = \frac{AQ\times10^6}{\pi} \cdot \frac{u^{b/d}}{(uh_s+C)^{1+b/d}} \tag{12}$$

The worst-case X_m value is given by

$$X_{worst} = \frac{AQ\times10^6}{\pi} \cdot \frac{1}{Ch_s^{b/d}} \cdot \frac{(b/d)^{b/d}}{(1+b/d)^{1+b/d}} \tag{13}$$

and occurs with a wind speed u_w given by

$$u_w = \frac{b}{d}\frac{C}{h_s} \cdot \tag{14}$$

For stable conditions, $X_m(u)$ has the form:

$$X_m(u) = \frac{AQx10^6}{\pi} \cdot \frac{u^{(b-2d)/3d}}{\left(u^{1/3}h_s+D\right)^{1+b/d}} \tag{15}$$

This function has no maximum for positive values of u unless b/d is larger than 2.

If more than one source is involved, exact analytic expressions analogous to Eqns. 4, 5, 13 and 14 cannot be found and additional approximations must be introduced if equations of comparable simplicity are desired. The first approximation is to consider all sources to be located at the same point, although still with different stack parameters. The total ground level concentration directly downwind of the source location is given by the generalization of Eqn. 1:

$$X_t = \sum_{i=1}^{N} \frac{Q_i x10^6}{\pi u \sigma_y \sigma_z} \exp\left[-\frac{1}{2}\left(\frac{H_i}{\sigma_z}\right)^2\right] \tag{16}$$

in which

N = the number of sources considered

Q_i = emission rate for the i-th source (grams/sec)

H_i = effective stack height for the i-th source (meters), equal to the sum of the physical stack height and the estimated plume rise.

As in the case of a single source, an equation may be derived for the distance at which the pollutant concentration is a maximum. This equation cannot be solved analytically, however, and may have more than one physically acceptable solution, corresponding to the existence of more than one maximum in the pollutant concentration as a function of downwind distance. For most accurate results, a detailed analysis of each situation is required. For the purposes of this work, a simpler albeit less accurate approach was desired.

The approach which has been adopted involves the assumption that the distance to the maximum concentration may be approximated to a sufficient degree of accuracy by a weighted average of the distances at which each individual source has its maximum impact. Thus, x_m is written in the form

$$x_m = \sum_{i=1}^{N} W_i x_{mi} \tag{17}$$

in which

$$x_{mi} = \left[\left(\frac{H_i}{c} \right)^2 \frac{1}{2\alpha} \right]^{1/2d} . \tag{18}$$

In order to estimate the plume rise associated with the i-th source, and hence the quantity H_i, wind speed values equal to C_i/h_{si} and 2.0 m/sec were assumed for neutral or unstable, and stable conditions, respectively. The weighting factors, W_i, were chosen to be proportional to the ratio Q_i/h_{si} in order to ensure that W_i is zero if the emission rate for the i-th source is zero and to approximately account for the effects of different stack heights.

Once the distance to the maximum is estimated, an average effective stack height $\bar{H}$ may be defined in a consistent manner from Eqns. 17 and 18. The distance x_m is given by

$$x_m = \left(\frac{1}{2\alpha c^2} \right)^{1/2d} \sum_{i=1}^{N} W_i H_i^{1/d} \tag{19}$$

and a natural definition of $\bar{H}$ is

$$\bar{H} = \left[\sum_{i=1}^{N} W_i H_i^{1/d} \right]^d . \tag{20}$$

With this definition, the relation between $\bar{H}$ and x_m is the same as for a single source:

$$x_m = \left[\left(\frac{\bar{H}}{c} \right)^2 \frac{1}{2\alpha} \right]^{1/2d} . \tag{21}$$

Evaluating the total concentration X_t, given by Eqn. 16, at the distance X_m yields the following expression:

$$X_m = \frac{10^6}{\pi u} \frac{1}{\bar{H}^{2\alpha}} \frac{c^{2\alpha - 1}}{a} (2\alpha) \sum_{i=1}^{N} Q_i \exp \left[-\alpha \left(\frac{H_i}{H} \right)^2 \right] \tag{22}$$

As in the single source case, the worst-case wind speed is taken to be that which maximizes X_m. In order to estimate this value, the dependence of $\bar{H}$ on u must be considered, although for simplicity it is assumed that the ratio $H_i/\bar{H}$ is approximately constant and its dependence on wind speed ignored. Also, for the sake of simplicity and for the purpose of estimating the worst-case wind speed, the average effective stack height $\bar{H}$ was assumed to be given by

$$\bar{H} \simeq \sum_{i=1}^{N} W_i H_i \tag{23}$$

instead of by Eqn. 20. This allows $\bar{H}$ to be written as

$$\bar{H} = \bar{h}_s + \frac{\bar{c}}{u} \quad \text{(neutral, unstable conditions)} \tag{24}$$

$$\text{with} \quad \bar{h}_s = \sum_{i=1}^{N} W_i h_{si}$$

$$\text{and} \quad \bar{C} = \sum_{i=1}^{N} W_i C_i \; . \tag{26}$$

With these approximations, the worst-case wind speed is given by

$$u_w = \frac{b}{d} \frac{\bar{C}}{\bar{h}_s} \; . \quad \text{(neutral and unstable conditions)} \tag{27}$$

With this estimate, the worst-case pollutant concentration is given by

$$\chi_w = \frac{A}{\pi} \frac{1}{\bar{C}\bar{h}_s^{\,b/d}} \frac{(b/d)^{b/d}}{(1+b/d)^{1+b/d}}$$

$$\cdot \sum_{i=1}^{N} (Q_i \mathrm{x} 10^6) \ \exp \left\{ \alpha \left[1 - \left(\frac{b}{b+d} \frac{h_{si}}{\bar{h}_s} + \frac{d}{b+d} \frac{C_i}{\bar{C}} \right)^2 \right] \right\} \tag{28}$$

although in practice it is more convenient to use Eqn. 22 and substitute in the numerical value of u_w. Also, in practice, if u_w, as estimated by Eqn. 27, was lower than 0.8 m/sec or higher than 15 m/sec, a value of 0.8 or 15 m/sec, respectively, was used instead.

As in the single-source case, a worst-case wind speed cannot be similarly defined for stable conditions unless b/d is greater than 2. A worst-case wind speed of 2.0 m/sec was used in practice. It is still convenient, however, to assume $\bar{H}$ to be given by Eqn. 23, in which case we may write

$$\bar{H} = \bar{h}_s + \frac{\bar{D}}{u^{1/3}} \quad \text{(stable conditions)} \qquad (29)$$

with

$$\bar{D} = \sum_{i=1}^{N} W_i D_i . \qquad (30)$$

Equation 22 is the basis for all short-term, multiple-source concentration estimates; if only one source is present, Eqns. 22 and 21 reduce to the exact analytic solutions for a single source, Eqns. 4 and 5, respectively. Separate calculations were made for unstable, neutral and stable conditions and the maximum value selected. The estimates obtained from Eqn. 22 are assumed appropriate for a 1-hour averaging time. To obtain estimates for other averaging times up to 24 hours, the 1-hour estimate is multiplied by the appropriate conversion factor, given in Table 2.

Table 2. Averaging Time Conversion Factors*

Averaging Time (hours)	Conversion Factor
1	1.00
3	0.83
8	0.71
24	0.58

*Adapted from Table 5.1, Ref. 14.

These factors reflect a power law dependence of concentration on averaging time with an exponent of -0.17.

C.2 LONG-TERM ESTIMATES

Estimates of the maximum expected annual average ground level concentration from a single source are based upon the "sector-averaged" form of Eqn. (1) (Ref. 14,15):

$$\chi(x) = \left(\frac{2}{\pi}\right)^{1/2} \frac{fQ\times10^{6}}{u\sigma_z\left(\frac{2\pi x}{n}\right)} \exp\left[-\frac{1}{2}\left(\frac{H}{\sigma_z}\right)^{2}\right] \qquad (31)$$

in which:

n = the number of sectors into which the entire 360° range of wind direction is divided into; and

f = the fraction of the time during which the wind direction is observed to lie within the sector of interest;

the other symbols having been defined previously. The maximum value of this function occurs at a distance x_m given by

$$x_m = \left[\left(\frac{H}{c}\right)^2\left(\frac{d}{1+d}\right)\right]^{1/2d} \tag{32}$$

and has a value given by

$$\chi_m = \frac{BfQx10^6}{uH^{2\beta}} \tag{33}$$

with

$$\beta = \frac{1+d}{2d} \tag{34}$$

and

$$B = \left(\frac{2}{\pi}\right)^{1/2}\frac{n}{2\pi}\,c^{2\beta-1}(2\beta)^{\beta}\ \exp\,(-\beta). \tag{35}$$

and with the vertical dispersion coefficient represented by Eqn. (3). In making the estimate of the maximum expected value of χ_m, values of c and d corresponding to neutral atmospheric stability and distances between 500 and 5000m are used and the effective stack height H is estimated using Eqn. (10). The values of B and β which result are 0.256 and 2.46, respectively. The maximum expected wind direction frequency in a single 22.5° sector (corresponding to n=16) was estimated to be 0.25 from an examination of the annual surface wind roses given for a large number of meteorological stations within the United States on page 78 of the U.S. Department of Commerce Climatic Atlas of the United States (1968). The value of the wind speed that is used is the nationwide annual mean wind speed, estimated at 4.4 m/sec from the annual wind speeds listed with the wind roses referred to above.

In the long-term, multiple-source case, similar approximations are introduced as in the short-term cases, and the basic equation is similar to Eqn. 22 except that Eqn. 31, instead of Eqn. 1, is the starting point in its derivation. The maximum concentration occurs at a distance x_m estimated by

$$x_m = \left[\left(\frac{\bar{H}}{c} \right)^2 \frac{1}{2\beta} \right]^{1/2d} \tag{36}$$

and is given approximately by

$$\chi_m = \left(\frac{2}{\pi} \right)^{1/2} \frac{n}{2\pi} \frac{fQ \times 10^6}{u} \frac{1}{\bar{H}^{2\beta}} c^{2\beta - 1} (2\beta)^\beta$$

$$\cdot \sum_{i=1}^{N} Q_i \exp \left[-\beta \left(\frac{H_i}{\bar{H}} \right)^2 \right] . \tag{37}$$

The values of n, f, u and β are 16, 0.25, 4.4 m/sec and 2.46, as in the single-source case. $\bar{H}$ is defined by Eqn. 24.

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